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THE

OPHTHALMIC REVIEW

A RECORD OF OPHTHALMIC SCIENCE

EDITED BY
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EDINBURGH.

WITH THE ASSISTANCE OF

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VOLUME XVIII.
1899.

LONDON
J. & A. CHURCHILL 7 GREAT MARLBOROUGH STREET

John Bale, Sons, and Danielsson Ltd.
Gt. Titchfield Street
London.

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ON FINDING THE AXES OF CYLINDRICAL LENSES.

By Ernest E. Maddox, M.D., F.R.C.S.Edin.
(Bournemouth.)

No other dioptric method discovers the axis of a cylindrical lens so truly as the usual plan of looking at a straight line while the lens is made to rotate in its own plane till the portions of the line visible through the lens, and those visible beyond the lens, appear continuous. This appearance of continuity tells that we have discovered either the axis, or the meridian at right angles to it, for in all other positions that portion of the line visible through the lens appears more or less tilted. The reason of this tilting can be very simply given by supposing a cylindrical lens to be composed of a number of indefinitely small prisms all increasing in power in proportion to their distance from the axis. The apices of these hypothetical prisms all point towards the axis in the case of minus cylinders but away from the axis in the case of plus cylinders. The reader will readily recall the well-known property possessed by prisms of causing apparent displacement of objects seen through them towards their apex. That is why a line viewed through a minus cylinder appears displaced towards the axis, as shown in fig. 1. In detail, the point *a* of the line appears displaced to *a′*, in a direction (*aa′*) perpendicular to the axis. Similarly *b* is displaced to *b′*, suffering a smaller displacement than *a* in proportion to the greater nearness of *b* to the

Ophth. Review. Vol. XVIII., No. 207, January, 1899.

axis, whereby the prismatic power is less. In like manner *c* appears displaced to *c′*, and so on.

Let us, for convenience, call the meridian at right angles to the axis the *equator* of the cylinder, and note the following—

(1) Lines viewed through cylinders appear tilted *towards* the axis of minus cylinders, but *away* from the axis of plus cylinders, thus agreeing with the apparent motion of objects seen through spherical lenses.

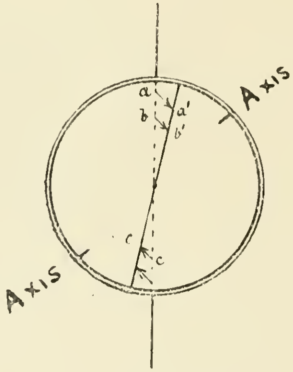

Fig. 1.

(2) Conversely, it follows that with respect to the equator of a lens, the rule is reversed.

(3) Plus cylinders held at a greater distance from the eye than the conjugate focus of the line looked at tilt the line like minus cylinders.

(4) The maximum delicacy of testing is I think attained, in the case of simple plus cylinders, by holding them almost at their own focal length from the eye, if the line looked at be a distant one, or almost at the conjugate focus if the line be a near one.

(5) With minus cylinders a distant line is advantageous, and the greatest delicacy is attained by holding the lens at a good distance from the eye.

(6) With sphero-cylinders it is not necessary, if the minus spherical element be relatively weak, to neutralise it. If relatively strong, it is better to be neutralised. With a plus spherical element it is better either to neutralise it, or to look at a line within its focal length, bearing in mind however that the latter procedure lessens the delicacy of the test.

After this little introduction, let us now consider how best to *measure* the inclination of the axis in degrees.

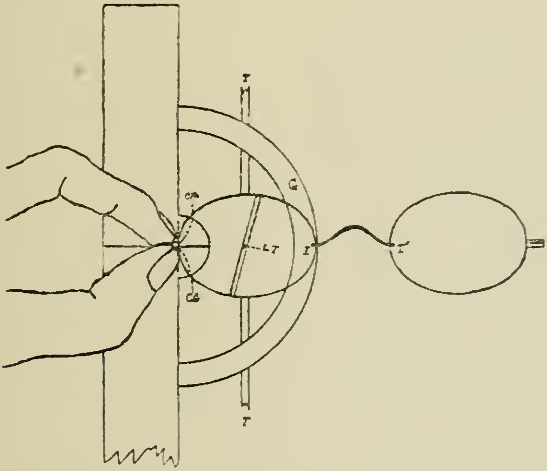

Fig. 2.

There must be few oculists or opticians who have not felt the need of a rapid and reliable method of testing the exact meridian. Of work-shop methods I am not able to speak, and though the Geneva Lens Measure is supplied with a graduated disc for the purpose, it is in practice difficult to use, and with weak cylinders not accurate enough. A recent device[1] by

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[1] Obtainable from the inventor, 4, Broad Street, Oxford.

Mr. Gradon, an optician in Oxford, is sufficiently novel and good to merit attention. It consists of a graduated semicircle attached to a short flat rule, and is shown in fig. 2. By the aid of marks on the rule ink dots are placed on the two extremities of the long or horizontal diameter of each spectacle lens to be tested. The rule is then held vertically, in alignment with some vertical line of the door or window, as in fig. 2. While one ink-dot is kept over the centre of the imaginary circle of which the graduated arc forms a part, the other ink-dot is moved along the graduated arc till a vertical line, viewed through the lens, appears continuous above, below, and through it (fig. 3). This second ink-dot now records the axis on the scale. The idea of using an arc whose radius is the long diameter of a lens is, I think, new. The rule itself is marked in inches and millimètres for making various measurements of a spectacle frame, and is fitted with an ingenious and very effective little appliance (fig. 4) for making the "in" and "out" measurements of the

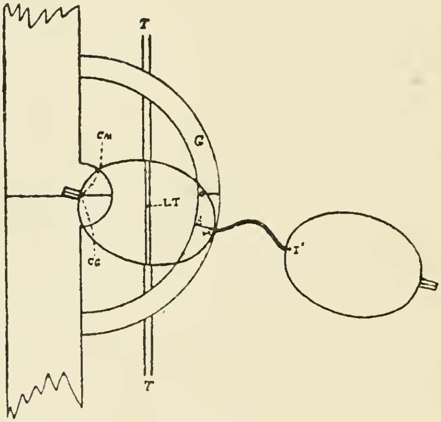

Fig. 3.

bridge. The principle of this axis-measure, known as "Gradon's Goniometer" is quite correct.[1]

Previously to making the acquaintance of this instrument, I had been content with a home-made device

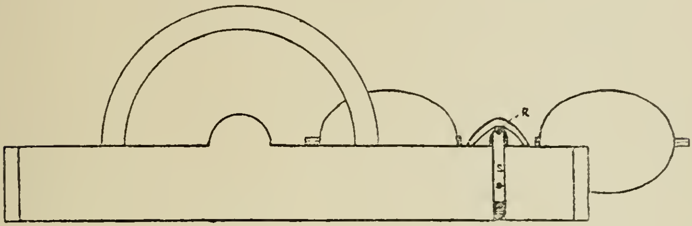

Fig. 4.

on a different principle altogether, and consisting merely of a horizontal strip of wood furrowed with a shallow saw-cut along the middle of its upper edge,

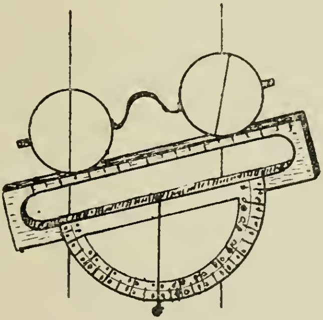

Fig. 5.

and fixed to a graduated semicircle with a weighted thread. This is shown in fig. 5 in a rather more elegant form, the wood being tunnelled to allow the vertical line looked at to be seen below the lenses as well as above them. As there shown, the spectacles, or pince-nez, are made to sit in the groove, and the whole apparatus is tilted till the axis (or equator) of each lens is found. The degree is then read off by the thread, or weighted needle. Two rows of figures are seen on the semicircle to enable any system of notation to be used. If the nasal end of each spectacle lens be taken as zero, one row of figures belongs to the right lens and the other to the left. Since each surgeon employs only one system it is easy to learn its application once for all. Should the equator of a lens be localised instead of its axis, 90° must be added or subtracted to find the inclination of the axis. It is an advantage to test spectacles with the legs pointing away from the observer just as they lie on the patient's face. It is an interesting procedure to test the accuracy of one's trial-frames with this instrument. It sometimes happens that a trial-frame gets a little bent, and then all the markings become misleading, and it is clear that, if these be incorrect, all prescriptions of cylinders from them will be inaccurate. No account, moreover, appears to be taken of the error which creeps in when trial-lenses a little too small are used—when, for example, un-ringed lenses are used in a trial-frame constructed for ringed ones.

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[1] Since errors of observation are less in proportion to the length of radius of the arc, I would suggest to utilise the whole spectacle breadth, from joint to joint, as a radius, and increase the size of the arc correspondingly, so as to dispense with ink-dots, since the two joints of the frame would suffice as indices.

Another use to which I have adapted this instrument is for measuring the distance between the optical centres of the two lenses by means of the millimetric scale shown in fig. 5. After looking at a vertical line on the wall through one lens and getting it (while the instrument is kept horizontal) to pass through the optical centre, shift the lens along the groove, or rather shift the instrument along while the spectacles are held *in statu quo* till the vertical line tallies with one of the markings on the rule. Then shift the whole combination, held firmly together, till the other optical centre is found in the same way. The distance between the two can then be read off. The instrument can, if desired, be fitted with a lens-clip to hold neutralising lenses, and is obtainable from Botwright and Gray.[1] The one disadvantage of my instrument is that it needs a strictly vertical line somewhere in the room. Most rooms, however, have this, and where not, a plumb line could hang upon the wall, or a picture cord be fixed once for all vertically. Those who use horizontal tangent scales can use them instead. Mr. Gradon's instrument has the advantage of being workable with lines which are not plumb, since parallelism of the ruler is all that is required, and after seeing his instrument it struck me that an

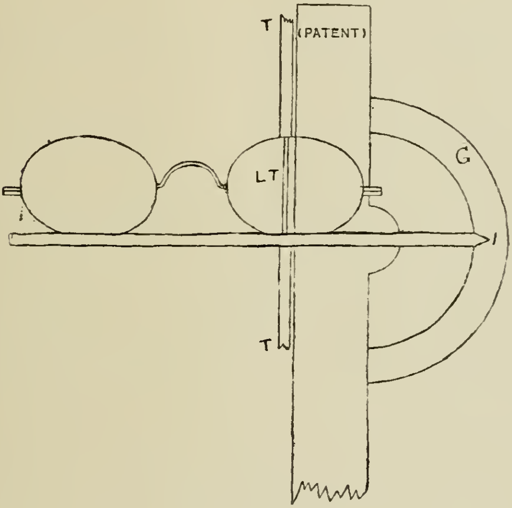

Fig. 6.

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[1] Spencer Street, Clerkenwell, E.C.

excellent one could be made by combining his idea of a parallelised ruler with mine of a groove for spectacles to rest in. There are many ways in which the combination can be effected. Fig. 6. represents one way in which Mr. Gradon has preserved the form of his former instrument by adopting the suggestion of a grooved bar; and this is now obtainable from him. I can heartily recommend it, and have requested it to be called "Gradon's Improved Goniometer," in recognition of the ingenuity of his original device. The best order of procedure, I think, is to use a Geneva Lens Measure, first of all, to find the nature of the cyclinder, and then locate the exact axis by one of the groove-bearing instruments, either the weighted thread one, or the parallel rule one. There is little to choose between these two, and since tastes differ, doubtless one will suit when the other will not. Those who are accustomed to work with ink dots will find Mr. Gradon's original goniometer, as in fig. 2, the most suitable instrument for that purpose.

PROF. SCHMIDT-RIMPLER (Göttingen). Spontaneous Absorption of Opacities of the Lens.

Berliner klinische Wochenschrift, October 31, 1898.

Spontaneous disappearance of cataract is so rare that any cases which do occur are well deserving of a careful record. It was not until 1885, when Brettauer published three cases at the meeting of the Heidelberg Ophthalmological Congress, that even the occasional occurrence of this phenomenon could be really admitted to exist. There are two possibilities, viz., either that the cataract is absorbed—of course without any injury or other means of laceration of the capsule—the lens at the same time becoming diminished in volume, or a *restitutio ad integrum*, whereby the cataract vanishes, its transparency being restored to the lens. In Brettauer's original cases partial cataract had existed for a number of years (nine to thirteen) when clearing up began, and the cortical matter had changed into a gelatinous mass in which were numerous crystals of cholesterin. In the cases in which a nucleus existed it had become reduced in size, as had the volume of the lens as a whole, and the iris was tremulous. In two of the cases the whole lens and capsule had shrunk away from the zonula, showing a crescentic edge in the pupillary area. Since that time so many cases have been observed that Natanson during this year was able to collect records of fifty, though all of these did not strictly belong to the same category, for where iritis, glaucoma, choroiditis or other inflammatory affection has been present, there is not a pure absorption of the semi-opaque lens, and a persistence of the contents of the capsule, more or less unreduced, but there is more apt to be a shrivelling of the whole turbid lens system. In such cases, as well as in the more classical form, a partial restoration of vision may take place, should part of the pupil be left clear by the diminution in volume of the lens. The fact that one not infrequently is able in a few such cases to remove the capsule of the lens entire, containing within it, as in a bag, the lens in the form of a milky fluid, to some extent shrunk in total quantity, seems to argue a previous stage of partial absorption. The author also regards the shrivelled white opaque lenses met with as a form of congenital cataract as belonging to this same class; such are often seen along with posterior synechiæ, and therefore, atropin giving only incomplete mydriasis, one first discovers their thin and papery nature on attempting to perform discission. But one meets also with absorption of the cataractous lens in the stricter sense of the expression—a condition which must be distinguished from the pathological shrivelling of which we have just spoken—a process which results in leaving a condition of affairs very similar to that which is to be found when an "after-cataract" remains after extraction of the lens. Schmidt-Rimpler next proceeds to relate two cases illustrating the different varieties, that, namely, in which a shrivelled and partially opaque lens remains behind, and that in which the whole lens is liquefied and carried away. Of these the following brief notes may suffice :—

Case 1.—A gentleman, aged 66, had been practically blind of the right eye for some years from cataract, and the left eye was now beginning to be affected ; he was myopic 12 D. On examination of the right eye after dilatation of the pupil, it was evident that the lens was to a considerable extent absorbed ; in the centre of the pupil was a whitish opacity very like an after-cataract, which towards the periphery faded away into a transparent membrane ; the extreme periphery of the pupil was free of this, and at this region, and over the area in which lay the transparent membrane, one could see the fundus. Vision with the pupil normal was = fingers at 1 m. ; with the pupil dilated, fingers at 4 m. There had been no injury to the eye at any time. At the extraction of the lens, after preliminary iridectomy, a portion of this capsule was torn away with forceps, and some greyish lens matter removed ; a larger amount remained behind. Eventually the remains of the whitish lens capsule and cortex mixed with chalky particles lay attached to the wound, and at the lower part of the capsule was to be seen the transparent grayish yellow shrunken nucleus. Vision with + 7 D. = $\frac{2}{3}$.

Case 2.—A gentleman of 81 had been operated on for cataract (left eye) eleven years ago, and was to return in six months to have the other lens extracted, but as he saw well with the left eye he neglected to have the other operated upon. He came to the author on account of the development of after-cataract in his left eye, with which he had vision only = $\frac{3}{20}$. His right eye, in front of which he carried merely a plane glass, was found to his great astonishment to be capable of $\frac{3}{10}$ with + 11 D. The lower half of the (dilated) right pupil was perfectly transparent ; across the middle of it the free lower edge of the lens capsule could be seen curving; the sac was quite empty and its edges slightly rolled together. Further up in the capsule were to be seen a few discrete, intensely white chalky particles; to the upper outer portion of the pupil lay a somewhat denser white capsular opacity of squarish form, measuring about 1½ mm. across, though even it was not quite opaque.

In the majority of the recorded cases the cataract has been fully ripe for some considerable time before absorption even begins, and probably the first change is liquefaction of the cortical matter, much as we see in the so-called Morgagnian cataract, but apparently, as in the first of the above two cases, liquefaction need not be quite complete before the process begins; it is possible, as suggested by von Hippel, that loss of the epithelium permits more free absorption. It has been observed by Colucci and Wolff that in certain of the lower animals, if the lens be removed, it is more or less completely replaced, though if the animal chosen be so high in the scale as the rabbit, the restitution is but imperfect. And it must not be forgotten that in man the development of cataract sometimes follows an abnormal course, the striæ and punctiform opacities remaining for long periods of time quite stationary, or advancing with extreme slowness. In illustration of this the author mentions the case of a lady whom he saw in her 65th year with somewhat well developed striæ in her lens, causing very considerable diminution of vision, but in whom the formation of cataract proceeded so slowly that up to the time of her death, twenty-seven years later, she was still able to go about, to read and to write. Minor degrees of the same condition one frequently sees, patients whose vision appears to become poor and to improve again even in the presence of a moderate degree of cataract. In certain cases Schmidt-Rimpler believes that he has seen improvement follow the use of an ointment of iodide of potassium rubbed into the parts surrounding the eye, and the instillation of a weak solution of the same drug into the conjunctival sac; in order to prevent irritation of that membrane, the solution (0·5 per cent.) should not be used for more than four weeks consecutively, but should have then an interval of about fourteen days.

There is a marked difference between absorption of a cataractous lens and the renewal of its transparency; and whether the latter process can take place in the senile lens is doubted by many; the author has no records of cases which convey to his mind certain proof of this, though a few instances in which vision has not merely not become worse, but has actually improved in spite of the presence at the first examination of minute areas of opacity, seem to point to this as at least a possibility. This has certainly been observed in rare cases in diabetic patients under treatment at Karlsbad, as recorded by Seegen, Gerhardt, and Nettleship. One case recorded by Nicati is of great interest: it is that of an old man of 78, who had always had good distant and near vision, but on examination was found to have bilateral radiate opacities and myopia of 9 D.; two years later there was no trace of opacity and vision was perfect. Nicati explained both the clearing up of the lens and the myopia as due to the cataract becoming liquefied, the lens thus assuming a more spherical form and an increase in refractive power; while, on the other hand, there must have been an abolition of the difference in refractive index between the opaque and the transparent portions. Schmidt-Rimpler is not quite sure of the correctness of this explanation, because we do not find these striæ existing along with the liquefaction of the cortex in Morgagnian cataract, and in the cases of liquefaction of the lens such as are referred to above; further, in persons so aged, there is always a marked nucleus. One often notes the occurrence of myopia in the stage of advancing cataract.

In traumatic cataract either with or without injury of the capsule, the opacity of the lens may indeed clear up or greatly diminish. Fuchs, who has recorded four cases in which traumatic cataract (without perforating wound) has cleared up, believes that this has been due, at least in part, to a temporary closure of the physiological lymph path in the lens; but it is known that opaque lens fibres may become clarified again and the vacuoles between them may vanish. In a few cases the surface of the lens has been seen to become opaque immediately after a contusion, and to clear up again in twenty-four to thirty-six hours.

The author made certain experiments on rabbits in regard to this matter, producing traumatic cataract by inserting a stop-needle into the lens through the cornea: the capsular wound often healed over very quickly, and from it a fine white streak passed down into the lens substance. Often, too, the corneal and the capsular wound were united by a fine thread running through the anterior chamber, and microscopic examination showed that this thread was largely composed of lens fibres. In rabbits, owing to the rapidity with which a simple punctured wound of the lens capsule heals, it is rather difficult to produce complete traumatic cataract without breaking up the capsule and lens a good deal with the needle, but in one case return to transparency was observed after an almost complete cataract had been produced. In this case a portion of the swollen lens came through the wound in the capsule and fell into the anterior chamber, but all that remained cleared up, leaving the lens a little smaller apparently than before. On removal and microscopic examination the len fibres seemed quite of normal aspect except such as lay close to the wound in the capsule. In these instances, during the experiments on rabbits, in which masses of lens matter escaped into the anterior chamber and lay against the posterior surface of the cornea, it was not unusual to find diffuse interstitial opacities of that membrane corresponding to the area of contact, into which vessels made their way from the margin, but such development is very rare in man to any degree even approaching to that seen in rabbits, and only occurs when the mass of lens matter remains lying in contact with the cornea for some very considerable length of time. The question arose, does this opacity of the cornea indicate a loss of endothelium of Descemet's membrane, thus permitting the aqueous humour to make its way into the meshes of the cornea? Recent investigations by von Hippel, jun., seem to show that when fluorescin is dropped into the conjunctival sac, areas denuded of endothelium, just as those over which epithelium is removed, are stained green. Now in two of the rabbits in which this opacity of the cornea was present the part was also stained green by fluorescin, and after removal of the eye that part was found to be denuded of endothelium. Yet another point of interest was observed, which indeed has been noted already by Schlösser, viz., that the prolonged inflammatory process which sets in with increase of tension after a free laceration of the capsule of the lens may be attended with an increase in the dimensions of the cornea, and its flattening out to a slight degree. Thus in a rabbit in which secondary glaucoma was thus induced and was allowed to go on, when at the end of three months the refraction of the globular cornea could be examined, it was found to possess in the vertical meridian a refractive power of 41·5 D., in the horizontal 39·5 D. The cornea of a very similar healthy rabbit showed 43 and 41 D. in the corresponding diameters respectively; the circumference of the cornea also was larger than in rabbits of the same size and weight; unfortunately, the other eye of the actual pathological rabbit could not be examined, as it had already been enucleated. Still, so far as it goes, this observation seems to show a flattening of the cornea as a likely consequence of increased tension, especially in those cases in which it becomes water-logged by the percolation into it of the aqueous humour when Descemet's membrane is partially removed.

This cannot fail to suggest to one's mind the possibility that all of the hypermetropia present in one's patients affected with primary glaucoma may not be a congenital condition, though we know that in the majority it is certainly so. May a small portion not be due to a slight flattening out, especially as, though from a different reason, the cornea is distinctly water-logged?

LUCAS (London). Gonococcus Joint Disease in Infants, secondary to Purulent Ophthalmia. *Brit. Med. Journal, January* 28, 1899.

In a paper read before the Royal Medical and Chirurgical Society of London, Lucas gives some particulars of all the cases of arthritis secondary to the purulent ophthalmia of infants which have been recorded since he first drew attention to this form of joint disease in 1885.

He has included twenty-three cases in his list, and although some of these admit of doubt, the large majority seem to be genuine examples of the affection under consideration.

Eighteen of the patients were newly-born infants, and infection of the conjunctiva occurred at or immediately after birth; the remaining five cases were in older children, and the eyes were inoculated from outside sources. The eldest was a child of 7 years, to whom contagion was conveyed by the finger of another child.

The joint disease is met with in two forms: (1) a very acute arthritis with much redness and swelling and tenderness; (2) a subacute synovitis, with considerable effusion, but little redness over the joint. The arthritic symptoms show themselves most frequently towards the end of the second, or during the third week of the conjunctivitis. The extremes have been the fourth day and the thirteenth week.

The disease exhibits a decided predilection in favour of the knee-joint (fourteen of the twenty-three cases). The wrist-joint comes next in order of frequency; the elbow, ankle, hip and joints of the hand and foot have all been affected.

In a few instances the arthritis subsides in from ten to fourteen days, but as a rule three to four weeks elapse before recovery is complete. Suppuration rarely occurs; in three of the twenty-three cases given, this result accrued.

The presence of Neisser's gonococcus in the inflamed joints has been demonstrated by more than one observer. In cases in which suppuration occurred in the joint, the author thinks it probable that double infection takes place ; in two of the three reported instances other micro-organisms were identified in association with the gonococcus; in one streptococci, and in another staphylococci were found.

The treatment, Lucas states, should be directed mainly to the conjunctiva, this being the source of infection of the joints. Locally, evaporating lotions may be of use, and the inflamed joints may be protected by cotton wool and a bandage. That this complication of purulent conjunctivitis of infants is very uncommon is evidenced by the fact that no one of the speakers in the discussion upon Lucas's paper had seen an example, with the single exception of Higgens, who had sent the first case to Lucas, and also by the fact that acute arthritis secondary to purulent ophthalmia is but seldom described by writers of text-books on general or ophthalmic surgery.

J. B. L.

BATTEN. The Pathology of Diphtherial Paralysis. *British Medical Journal, November* 19, 1898.

At the meeting of the British Medical Association in Edinburgh last year Dr. Frederick E. Batten read in the Section on Diseases of Children a paper under the above heading, giving the results which he had obtained in six fatal cases in which he had examined the various central and distributional parts of the nervous system by the Marchi, the Marchi-Pal, and the Nissl methods. The following are the changes found by him to be present or to be absent as the case may be. Examined by Nissl's method, the spinal cord showed no change whatever in the cells either of the anterior horn or of the posterior root ganglia, the granules and the prolongation of the cells of the anterior horn appearing perfectly normal in size and distribution. Examined by Marchi's method (*a*) the anterior root-fibres as they pass through the white matter are seen to have undergone degeneration, they become scattered as they enter the gray matter; (*b*) the anterior spinal roots have the myelin sheath of the nerve broken up into granular fatty masses, some of which are fused together—the changes being very similar to those found in a peripheral nerve after section; (*c*) in the posterior roots the same changes are found, but to a less degree; (*d*) the posterior root ganglia are unaltered, but the fibres on both sides show decided alteration; (*e*) in the peripheral nerves the fibre is broken up and the myelin sheath appears to be filled up with fine fat globules, which may coalesce. It is probable that these changes do not affect the whole length of a fibre at precisely the same time. After giving details of each case which he examined Batten says: "The evidence . . . points to a parenchymatous degeneration of the nerve. That the affection is primarily peripheral would seem probable from the fact that the fibres on both sides of the posterior root ganglia are involved, and the fact that by Nissl's method the cells of the anterior horn appear perfectly normal. It has, however, lately been shown by Mouravjeff that changes in the cells of the anterior horns occur during the first weeks after infection, whereas the parenchymatous change in the nerves was most marked five to six weeks after infection—at which time the cells in the anterior horns had recovered or had undergone atrophy, so that in the present series of cases the normal appearance of the cell cannot be used as an argument against a primary cell infection." The author then gives a very interesting *résumé* of the various papers published in most recent years on this subject, briefly discussing as he does so the differing views as to the pathology put on record by various authors, who by no means agree either as to their observations of the condition of the nerve fibres and cells, or as to the interpretation to be put upon such pathological changes as they did see. He adds that, although various views have been held with regard to the pathology of diphtherial paralysis, it is at the present time generally recognised that the lesion most commonly found is a parenchymatous degeneration of the myelin sheath of the nerves, and Martin has shown that this condition affects primarily the finer nerve branches. More recently the work of Mouravjeff would tend to show that the primary alteration occurs in the cells of the anterior horn. "In conclusion, then, it is probable that the dominant lesion in diphtherial paralysis is a parenchymatous degeneration of the myelin sheath of the nerves, and that this degeneration affects both motor and sensory fibres alike."

Now there is a clinical fact to which it always appears to us too little attention is paid by those who discuss the pathology of post-diphtheritic paralysis. It is this: of all the paralyses that occur (with the exception of the palatal paralysis, which may be a local and immediate effect of the presence of the diphtheria patches), none is so common as that of the ciliary muscle. How is it possible that this, the commonest of all, can be other than a nuclear lesion? Is it possible to imagine that the fibres travelling in each third nerve to this muscle alone should be simultaneously, equally, completely, and solely affected by a neuritis or a primary breaking down of the myelin sheath? For it must be remembered that cycloplegia is always bilateral, always equal, and practically always unaccompanied by interference with any other muscle supplied by the third nerve; there is no squint or ptosis in the great majority of such cases, and the pupils act well. One curious and very interesting complication has been recorded by several writers which will serve, if that were required, to drive home the argument, namely, the occurrence of a paralysis of convergence without any weakness of the internal recti in conjugate movement. We do not for a moment dispute the presence, at least in the fatal cases, of changes in the nerve fibres, but we do not accept the conclusion that these are primary; clinical evidence speaks most emphatically in opposition to such a verdict.

SNELL (Sheffield). Effect of Medicinal Treatment on certain apparently Malignant Tumours of the Orbit. *Quarterly Medical Journal, October*, 1898.

On this subject Panas and others have written. Snell's present contribution to the literature of this question, so interesting and so important, consists of an account of five cases, two of which are now published for the first time, in which the vigorous use of iodide of potassium was followed by complete disappearance of tumours regarding which there seemed to be no reasonable doubt that they were malignant. The patients were all about "cancer age," the youngest being 40, and the eldest 57, and in none of them was there any real evidence of any other cause for the presence of a growth of such an aspect. "To assert that syphilis is the cause of these growths is the easiest way of meeting the difficulty as to their nature. I feel sure that this would be incorrect in many of the instances, however true it might be in others." Some surgeons are content to regard disappearance of a growth under iodide of potassium as a sufficient proof of the syphilitic nature of a tumour, an opinion which seems to us to be unscientific in character and untenable in fact, and from which we have always dissented. Mr. Snell's cases, one is safe to say from the clear account which he gives of them, were not syphilitic. A case not dissimilar was published in this REVIEW in 1897 (p. 296), by Mr. C. G. Lee. (*See also* p. 80, OPHTHALMIC REVIEW, of the same year.)

TAMAMCHEF (Baku). Diphtheritic or Necrotic Conjunctivitis and its Treatment with Iodoform. *Centralblatt für praktische Augenheilkunde, November and December*, 1898.

In the author's district true diphtheritic conjunctivitis seems to be no extreme rarity, for he met with nine examples out of 10,000 ophthalmic cases of all sorts. All the patients lived in bad hygienic conditions, and belonged to the lower classes. In his paper on the subject Tamamchef, when dealing with the clinical features of the disease, draws a sharp line of distinction between croupous conjunctivitis, where a false membrane is formed on the conjunctiva, and true diphtheria, where the mucosa and sub-mucosa are themselves infiltrated, though he admits the existence of certain intermediate forms. Certain of the clinical points in the diagnosis may be briefly indicated :—In croupous or fibrinous conjunctivitis, as he prefers to call it, the membrane is, comparatively speaking, easily lifted off, leaving exposed a conjunctiva reddened, succulent, smooth, and apt to bleed on the lightest touch ; while in diphtheritic or necrotic conjunctivitis the membrane is closely incorporated with the lid, and the mucous surface below is pale and bloodless from the obliteration of vessels ; the membrane itself is thick and pulpy, with scab-like necrotic areas, it extends deep into the submucous tissue, and its margins are ragged and irregular. The lids themselves are hard, œdematous, and pale in necrotic conjunctivitis, while in the fibrinous form they are swollen, puffy and elastic. Croupous conjunctivitis may last a considerable time, but in many of the cases of true diphtheria the cornea disappears as the disease progresses, like sugar on which hot water is poured ; in it one has to give a very unsatisfactory prognosis. In both diseases fever is present, but in diphtheria there is a sort of dull, apathetic condition which one does not see in the other class of patients. He bases his diagnosis on the clinical features, and thinks a bacteriological examination aids but little, as the results obtained by various observers are so conflicting and the exact relations of organism and disease by no means fully understood as yet. Thus, for example, Loeffler's bacillus may be present though there is no true diphtheria, and the pseudo-membranous variety can apparently be produced by any one of several organisms, and Loeffler's bacillus actually be present. As regards treatment, Tamamchef declares in favour of thorough cleansing of the lids with formalin solution (1 in 2,000), without any attempt to detach the membrane; he then dusts the conjunctival sac thoroughly over with sterilised iodoform in the finest possible powder, and applies a dressing. This is repeated every twenty-four hours, and in from one to three days marked improvement sets in, the lids losing their hardness, and the swelling subsiding. While this is going on he thinks careful attention ought to be given to the patient's state of health generally—a point which is apt to be a little neglected. In all his nine cases he was able by the above treatment to save the cornea intact—a wonderful record for diphtheritic conjunctivitis. Though he considers formalin to be a very useful application in chronic conjunctivitis, blennorrhœa of the lacrymal sac, corneal ulcer, &c., he found this mode of treatment—formalin and iodoform-dressing—to be quite useless in other severe forms of conjunctivitis, *e.g.*, gonorrhœal and trachomatous. Mention is made of the serum treatment, but the author does not seem to have tried it.

J. V. Paterson.

BRUDZEWSKI (Cracow.) The influence of Illumination upon Visual Acuity for Coloured Objects. *Archives d'Ophtalmologie, November*, 1898.

Many observers—among others, Foerster and Klein—have studied with great care the alterations which visual acuity undergoes during variations in the illumination, and have endeavoured to enunciate and define the laws which govern these changes. Klein differs from most other workers in his opinion that visual acuity rises with the increase in illumination, but always to a more or less rapidly diminishing degree. Macé de Lépinay and Nicati were the first to investigate the variations in visual acuity under coloured illumination (1881-1883); they employed spectral colours in their experiments, but as this is very inconvenient, Uhthoff substituted coloured cloth when pursuing his inquiries; a similar method has been followed by Brudzewski, only he used daylight in place of artificial illumination. He employed red, blue, green and yellow papers; the red and the blue were of great purity of colour, and appeared of equal brilliancy when exposed to bright daylight; the green was faintly bluish and its tint was less saturated; the relative quantities of colour were determined by means of Maxwell's rotating disc. For the estimation of visual acuity letters corresponding exactly to Snellen's types were carefully cut out of the various coloured papers, and the author considered that the higher standard of vision which he obtained as compared with some other observers was due to his using such a method, and not employing printed letters, which are apt to reflect light in a troublesome way and thus to appear of a complementary colour to the background. At first he made the test scale the extremity of a perfectly blackened box, but latterly employed simply a piece of black velvet, which he found to answer quite as well. Upon each sheet were eleven series of letters of different sizes varying between No. 3·75 and No. 60 of Snellen; these sheets were placed side by side at 6 m. distance from the person examined; and the amount of vision was determined for the four sheets each in turn in such a manner as to avoid the effects of any alteration of illumination. To escape such a source of error, the examination was made in a room to which daylight had access only by one square window looking to the north, and whose area could be altered at will, somewhat on the system of Foerster's photoptometer. A scale on the diagonal of the window showed at a glance its superficial area at any moment. A more difficult problem was to estimate the amount of light entering by it, but this it was needful to do since the brightness of the day was apt to vary greatly. The method by which this was accomplished was to compare the shadow cast by one object from the window light with that which the same object cast from a standard candle whose distance could be varied at will until the two shadows were of equal intensity. At first this was not easy, for the colours of the two shadows were different, but a little practice overcame the difficulty. If the candle required to be placed at less than 2, or more than 5 m. distance from the chosen object, then it was found advisable to alter the size of the window area ; all the observations were made between 10 a.m. and 12 noon, the sky at the time being free from clouds. The routine was to determine, first, the amount of light, then to make three or four estimates of visual acuity, then vary the size of the window, measure the quantity of light again and make further visual tests. A factor which in such experiments has to be taken into account is the question of adaptation, but since the time required for this to occur is small if the difference between the two illuminations is slight, and since the room in which his experiments were conducted was always more or less in obscurity, the author considered that a period of twenty minutes was sufficient to allow for this to take place. Taking, then, as his unit the amount of light given by a standard candle at 6 m., the amount of illumination varied in the whole range of his experiments from 0·002 to 1,800 ; he also tested in direct sunlight, whose value is given by Javal as being in the month of July represented by 250,000 candle-mètres.

Without repeating all the author's figures and charts, we may reproduce the following selection, which shows the main fact, viz., that with all colours there is a rapid increase in acuity until the amount of illumination reaches 100, after which the improvement is very small.

VISUAL ACUITY.

Illumination.	White.	Yellow.	Green.	Blue.	Red.
0·002	0·016	0·003	0·003	—	—
0·02	0·06	0·05	0·05	0·03	—
1·2	0·2	0·14	0·13	0·1	0·04
10·3	0·75	0·7	0·55	0·2	0·2
89·1	1·22	1·2	1·0	0·5	0·8
920·0	1·6	1·5	1·4	1·0	1·3
1850·0	1·8	1·75	1·6	1·4	1·6
Direct Sun	2·1	2·0	1·8	1·8	1·8

A point of some importance is brought out graphically by the author's charts, viz., that the letters of the table with the red background only become visible when the degree of illumination, is very considerable, white, yellow, green, and blue all becoming visible under much feebler light than is required for red; but when the red table does become visible it gains rapidly upon blue with the increase of illumination, and they become equal in this respect at 4·9, at which period the acuity for the two colours stands at 0·13. The author draws attention to another fact which has been known in a slightly different form for many centuries, and which is borne out by his investigations, namely, that black letters are more readily distinguished on a blue ground in indirect than in direct vision; this holds good, it should at once be observed, only when the illumination is very feeble, not when the amount of light is at all great. This inferiority of the macula for blue light is specially to be noticed when dealing with minute objects, which may disappear completely when looked at directly, and re-appear when the image falls a little to the side of the macula. It does not seem that any thoroughly satisfactory or universally accepted explanation has as yet been given of this phenomenon, of which astronomers are well aware. The paper is of some interest, but it does not bring to light much with which one has not already been familiar.

FRANCOIS QUERENGHI. Treatment of Entropion by Cauterisation of the Lids. *Annales d'Oculistique, October*, 1898.

The honour of having been the first to suggest the use of the cautery in the treatment of entropion and trichiasis is claimed by various authors for Magni and for Cusco. According to the author, the former was at least the first to put the method into actual practice. Querenghi, who has employed the method in a hundred or so of cases, seems usually to operate under cocaine, though he admits that the procedure is somewhat painful, and that at least in children or nervous patients it may be better and safer to administer a general anæsthetic. A minor point, though it is one which meets the operator at the outset, is the choice of a cautery, and Querenghi gives the very wise advice to select a type in which the actual candent tip does not project far beyond the handle, as such an instrument is manipulated with much greater ease and accuracy than any other. This is a matter which has sometimes appeared to us to receive less attention at the hands of instrument-makers than it merits, especially when dealing with apparatus for application to the cornea. During the use of the Paquelin cautery the cornea must be protected by a spatula, which may be of horn, but obviously must not be made of celluloid or similar inflammable material; this shields the cornea, not merely from actual contact with the burning point, but from injury by the heated gases with which the cautery is kept incandescent. Querenghi operates with the patient sitting on a chair behind which he stands; the spatula being placed in position, it is held by an assistant, while the operator, keeping the skin of the lid well on the stretch with one hand, with the other applies the cautery to the skin surface of the lid, beginning at the inner end outside the punctum, of which, of course, the greatest care must be taken, as any interference with the lachrymal apparatus would be most disastrous. The line of application should be about 4 mm. from the lid margin, in order to be sure that no injury be done to the hair-bulbs of the eye-lashes. The action of the cautery should be sufficiently deep to pass through skin and orbicular muscle, and score the anterior surface of the tarsal cartilage. The depth to which this is done should be made to depend upon the severity of the original entropion. If the little operation has been sufficiently done, then on opening the eye, which the patient should now be asked to do, the position of the lid ought to be perfect. Iced antiseptic lotion and a simple dressing are generally enough to allay the resulting pain, which is not, as a rule, very severe. About the third day the eschar is ready to come away, and when it has been removed, pains should be taken to get the edges of the wound into good apposition. Aristol or other antiseptic dusting powder should be applied and a supporting bandage. Four days later the wound is quite healed, and after the lapse of a couple of months it is difficult to perceive any scar.

It is not desirable in this procedure to have the cautery too highly incandescent, as if it is so it cuts through the tissues without giving the operator that knowledge of depth which he obtains from the feeling of resistance offered to a cautery less intensely heated, and it is essential for the success of the operation that he should know exactly the moment he reaches the tarsus, and to what degree he is scoring it; besides which, according to Querenghi, hæmorrhage is more apt to occur. The operation has the further advantages also that it is not merely simple to perform but easy to repeat, a very distinct point in its favour as contrasted with certain other operations applicable to similar cases. Has it, however, any superiority over the similar procedure with knife or scissors?

BRASCH and LEVINSOHN (Berlin). Migrain with Orbital Hæmorrhages. *Berlin. klinisch. Wochenschrift, December* 26, 1898.

Hæmorrhages into the orbit, apart from traumatism, are very rare, but the peculiar interest of this case lies not merely in its occurrence and recurrence here, but in its association with hemicrania and certain alterations of the field of vision. A man in good health, aged 23, of a somewhat migrainish stock, suddenly experienced violent pain over the left eye; the eye rapidly swelled up, he felt squeamish and vomited, but very soon the pain passed off. Three months later the same was repeated. On examination there was found to be slight exophthalmos; very slight rise of tension in both eyes, so that the mere touch of the finger was sufficient to produce pulsation in the retinal arteries; distinct venous engorgement of the fundus; V. = $\frac{6}{15}$ right, $\frac{6}{35}$ left, but there was some reason to think it had never been any better; field of vision good; swelling of left eye, with slight discoloration of the lower lid. A third attack five months later, and a fourth were quite similar, but the fifth was more severe; the lids and conjunctiva were full of blood and much swollen; the fundus of the left eye showed much venous congestion; the left pupil was dilated and inactive to direct light; the lower half of the field in the left eye was lost. In the patient's general condition nothing pathological was to be found; this attack came on when the patient was at stool. Improvement in all respects was rapid, central and peripheral vision being quickly restored, and the proptosis, &c., diminishing.

Hæmorrhages are of course not infrequent in other situations in hemicrania, though not in the orbit, and the repeated recurrence of this is very singular. Does it tend to render more probable the "vascular colic" theory of migrain? Spasm of vessels, paralysis of their walls, then hæmorrhage from them, is suggestive, though the lesion causing the actual hemicrania cannot of course have itself been in the orbit.

NOTES ON IDIOPATHIC RECURRENT INTRA-OCULAR HÆMORRHAGES IN YOUNG PERSONS, WITH CASE.

By Victor Miller.

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This case presents some interesting features, and as the majority of the text-books give only a very short account of similar cases, these notes, I think, may prove not unworthy of record.

T. C., aged 28, married, fireman on a locomotive, and residing at North Ormesby, Middlesborough, was referred to me on September 20, 1898, by Dr. Knott for an opinion.

Patient stated that on September 17—a very hot day—at five minutes to one o'clock (he noted the time exactly, one being the time for dinner) he observed a dark spot before the right eye. It was in shape like a fly with long legs, and as the eye moved the legs appeared to move up and down. The spot increased in size, and later in the afternoon the sight of the eye "became a thick mist," and just before five o'clock he could see nothing at all with it.

Examination.- Pupils equal and react to light directly and indirectly, and on accommodation; vision reduced to the faintest perception of light. Tension normal.

Ophthalmoscopic Examination. Distant direct with plane and concave mirrors :—The reflex of the affected eye was much darker than usual, and gave one the impression at first that it was a case of hæmorrhage into the vitreous, but no opacity of any kind was to be observed in any position of the eye.

Oblique illumination carefully carried out with one and two lenses, and pupil widely dilated, showed no trace of opacity in the media.

The indirect method revealed no details of the fundus.

The direct method revealed traces of retinal and choroidal vessels in an area about three-quarters the size of the disc at the extreme outer side. The retinal vessels were partly bordered by white lines. Careful use of the lenses in the refraction ophthalmoscope showed the lens and vitreous to be quite normal.

I expressed the opinion that it was a case of extensive hæmorrhage, either subhyaloid in character or occurring between the retina and the choroid. I should mention that there was no history of injury of any kind previous to the attack. Perfect quiet in bed was prescribed, with both eyes tied up, and the administration of five-grain doses of iodide of potash. This was carried out for a month without apparent benefit. Three months after the first examination I again saw the patient, and was surprised at the extraordinary change which had taken place in the eye. The vitreous was filled with a greyish yellow, turbid, membranous mass, close up to the posterior capsule of the lens; wavelike movement was imparted to some of this when the eye was quickly moved from side to side, but no trace of retinal vessels could be made out on it. At the periphery of the lens, that is in the ciliary region, small accumulations of blood were seen, more particularly towards the lower side; and further, the iris had undergone a marked change in colour, namely, from being bright blue it had become a greenish brown, due no doubt to staining with blood pigment. The patient assures me it was blue before the trouble, and from the colour, I had no doubt in my own mind, it was due to blood staining. The tension at this time was not appreciably altered. When taken along with the previous history, the present appearance puzzled me greatly, and I began to discuss the differential diagnosis of detachment of the retina, tumours, pseudoglioma, and tubercle, the last of which led me to enquire into the family and personal history, and the latter revealed some very important facts.

Personal History.—Patient stated, that as a schoolboy he "*used to bleed awful at the nose.*" When he commenced to go to work it gradually stopped, though three years ago, for six months, it was very bad nearly every morning and evening when he started to wash himself.

A year and eight months ago he suffered from typhoid fever and had much hæmorrhage by the bowel. He had had influenza three times, the last attack three weeks previous to the beginning of the eye trouble. Another point brought out was the fact that fifteen years ago, when hoeing in the fields, he noticed the same sort of fly-like spot suddenly appear before the same eye. This was followed by mistiness which soon passed off, but the scotoma remained for a fortnight. Five years ago the same thing occurred again, but lasted only a few days. There is no history of venereal disease. There is nothing to be learnt to show that he is a "bleeder." The heart and blood vessels appear to be quite normal. There is no rheumatic or gouty diathesis. There is nothing in the urine. The digestion is good, and the bowels are regular and usually have been so. Patient is somewhat delicate looking, is fair, with rather fine transparent skin.

There is no doubt that it is a case of intra-ocular hæmorrhage beginning in the retina or choroid, and afterwards bursting into the vitreous and breaking up and causing disorganisation of the same. That it may be classed among that group known as "recurrent intra-ocular hæmorrhages occurring in adolescents" is evident from the history; as we have seen that twice previously he had a hæmorrhage; and also he at one time had very frequent attacks of epistaxis.

As to whether it originated in the retina or the choroid, it is difficult to say. The hæmorrhage is usually believed to take place from the choroid, judging by the ophthalmic changes seen after absorption, though some authorities, however, among them Leber and Eales, think the hæmorrhage sometimes comes from the retina. In some cases which become glaucomatous, the hæmorrhage has very probably a retinal origin.

The etiology of these cases is obscure, and various theories, none of which are satisfactory, have been put forth.

The condition was first described by von Graefe, and among others who have given attention to the subject are Eales of Birmingham, Hutchinson, Mayweg, Dor, Leber, Nieden, and recently M. Abadie of Paris.

It is more common in young men than young women, and there is often a history of epistaxis previous to the hæmorrhage. Some think it is associated with the menses in young women, and in young men with irritability of the generative organs.

Eales, who has paid a good deal of attention to the subject, thinks the condition due to a "neurosis affecting the circulatory and digestive system," and propounds the following rather elaborate theory:— "From the character of the hæmorrhage and from evidence of local variations of the circulation, from the slow pulse, constipation, flushing of the face, headache and puffiness and discolouration of the eyes, I am inclined to attribute this combination of conditions to a neurosis affecting both the circulatory organs and the digestive system, leading, on the one hand, to partial inhibition of the muscular movements of the bowels, and to a vaso-motor contraction of the vessels of the alimentary canal with inhibition of its secretory function, thereby causing dyspepsia, constipation, malnutrition, and on the other hand to a compensatory dilatation of the systemic capillaries, especially those of the head, and in these cases of the retina, causing over-distension of the venous and systemic capillaries, with liability to rupture on the occurrence of any intensifying cause. Hence the headache, the epistaxis, the retinal hæmorrhages, and the tortuosity and fulness of the retinal vessels and temporal artery."

Hutchinson says of hæmorrhage into the vitreous in young men :—" In some, there is hæmorrhagic diathesis ; in others, habitual constipation. In others, again, a gouty diathesis. In most, no demonstrable cause." He says in one case, that of a woman, it was vicarious, the menses being suppressed. Dor has recorded a similar case. So in women, at any rate, there seems to be distinct evidence of its being vicarious and associated with the functions of the generative organs. Panas of Paris, from the condition being frequently associated with epistaxis, has termed it " Intra-ocular Epistaxis."

Abadie[1] described the following four classes of cases : (1) Sudden and recurrent hæmorrhages. In these there is usually a history of frequent epistaxis. The changes which take place in the organism during the adolescent period are suggested as a probable cause. (2) Hæmorrhages connected with dyscrasia.

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[1] See OPHTHALMIC REVIEW, 1898, 211

In these the onset is more gradual, and the patient is usually seen when the vitreous is turbid, or even opaque. There is no pain, the tension is normal, the pupil reacts to light. In these there is sometimes a predisposing cause, namely, pregnancy, hæmophilia, phosphaturia, pernicious anæmia, malaria, influenza. (3) Apoplectiform retinal hæmorrhages. In these the blood infiltrates the choroidal and retinal tissues, also the iris, which becomes altered in colour and texture. The pupil is generally dilated, the tension raised, and there is pain of a glaucomatous character. The hæmorrhage is said to be due in this instance to a diseased condition of the vaso-dilator fibres of the sympathetic which controls the vessels. (4) Intra-ocular hæmorrhage in cases of choroido-retinitis. In these there are patches of choroido-retinitis.

This case seems to partake of the character of the first three groups, as shown by the epistaxis, the turbidity of the vitreous, the absence of pain or alteration of tension, and by the blood-staining of the iris and its alteration in colour. But there was never any glaucomatous symptom.

As regards treatment: Abadie recommends iron, ergotine, and especially quinine. He thinks quinine has a special power over the blood-vessels of the retina and the eye generally, as observed from cases of quinine poisoning. He also recommends citric and sulphuric acid lemonade, mercury in choroidal cases, blood-letting, &c.

Mayweg, of Hagen, writing in the *Transactions* of the Heildelberg Ophthalmological Society upon recurring hæmorrhage into the vitreous, mentions a case in which it occurred ten times. All treatment was useless, and as the other eye had been lost and enucleated from the same cause, the common carotid was tied; the hæmorrhage was absorbed, and vision improved from the recognition of hand movements close to the eyes to V. = $\frac{20}{50}$, and continued so for a year and a half.

In my case the only treatment the patient received was the rest and the iodide of potash, and after the lapse of four months some citrate of iron and quinine for a week.

Present Condition.—Light perception rather improved. Recognises a white object when moved at the inner side of the field of vision.

Iris not so blood-stained, and at the lower and outer side seems returning to natural colour. The pupil reacts to light. The tension seems slightly minus, there is still a membranous mass filling up the vitreous, and at the periphery of the lens there are one or two accumulations of blood, the largest at the lower side.

ALFRED MOLL (Berlin). Bacteriological Studies in Experimentally-Induced Sympathetic Ophthalmia, *Centralblatt f. prakt. Augenhlkde, December*, 1898.

On the subject of sympathetic ophthalmia there is much written, and much speculation, but little certainly known; it has been Moll's aim by a carefully conducted series of investigations to add to the stock of facts. He starts from the dictum laid down by Schmidt-Rimpler that the irritation of the ciliary nerves of an injured eye only sets up the *disposition* or tendency to sympathetic ophthalmia in the second eye by a derangement of circulation and nutrition reflexly induced; to follow up this idea he thought it best first of all to ascertain what is the influence upon the circulation of an infected individual of a local persistent irritation of the eye. For this purpose it was essential to infect the animal chosen with a micro-organism which could be readily and with certainty identified; he therefore infected rabbits with bacillus pyocyaneus. This microbe when grown on agar-agar imparts a distinct green colour to the nutrient substance, which affords a ready and rapid means of recognition; the plan pursued was to introduce into a tube of bouillon a loop dipped in a perfectly pure and fresh first culture; this was kept at room-temperature for twenty-four hours, and thereafter ½ c.cm. of it was injected under antiseptic precautions into the marginal vein of a rabbit's ear. To produce the necessary local reaction in the eye Moll followed the advice of Panas and used pure nicotine at first, but finding that even a minute quantity introduced into the vitreous was apt to cause death by heart failure, he had somewhat to alter his methods. Under an anæsthetic, and after careful disinfection of the eye, he made a small incision in the limbus corneæ and with most particular aseptic precautions inserted so as to stick into the iris a fragment of sheet-copper, three cornered in shape and about 1½ mm. in length, heated; the eye was again washed and the lids sewn together. Sometimes instead of the copper he introduced ½ a drop of croton oil into the vitreous chamber; the consequence of this is a pretty rapid formation of hypopyon, from the pus of which the bacillus can readily be obtained in pure culture. This succeeded in a few instances of rabbits which possessed sufficient resisting power to live long enough to eliminate the bacteria from the blood, a phenomenon already well-known in bacteriological work. (In some of the cases of more severe general infection which were treated with croton oil, the whole eye suppurated, yet neither by colouration of the pus nor by any other symptom could the presence of the bacillus pyocyaneus be demonstrated; in fact they behaved exactly as did the control animals in which croton oil had been injected, but no bacillary general infection had been set up; one is obliged to conclude that the bacteria in the pus had retained life but lost their pathogenic power; for injection of a fresh culture of the microbe into the anterior chamber produced immediate suppuration.) We may take it that a persistent local irritation of the eye produces a *locus minoris resistantiæ*, to which the germs existing in the blood travel along with the leucocytes; it is of great importance to know what is at the same time taking place in the other eye. Bach, who has also attacked this problem, has observed both chemical and microscopic changes in the aqueous humour of an eye affected with iritis and cyclitis, and even in the other eye. These changes in the other eye only occur, according to Bach, if one particular symptom has persisted, viz., pain. Moll varied the experiment by poisoning with the bacillus pyocyaneus, and examining the aqueous bacteriologically. His method was as above described with the piece of copper in the anterior chamber and the injection in the ear. If the animal lived twenty-four hours, the other eye showed only some contraction of the pupil, but cultivation of the fluid obtained by tapping the anterior chamber gave, in the great majority of instances, typical colonies of pyocyaneus with green colouration of the nutrient. Similar results were obtained when he produced the local irritation, not by means of a foreign body, but by cauterisation of the cornea (of course without using cocaine or any general anæsthetic) about an hour after the intra-venous injection. After twenty-four hours the aqueous was tapped from each eye separately, the greatest care being taken lest the syringe should touch vascular tissue either of corneal margin or iris, and so pick up bacteria. In the majority of cases pyocyaneus was cultivated successfully from each eye. Cultivations were at the same time made from the blood of the animal; where these gave no reaction, it is plain that no infection of the canula from the iris vessels could possibly account for microbes found in the anterior chamber. Some cases were found in which the bacillus, though present in the blood, was found in the wounded eye only, probably because the stimulus applied was insufficient. Control experiments in which the bacillus was introduced but no local irritant was applied, gave negative results almost invariably; the above does not apply to those animals which died or were severely affected in health by the injection, since it is the case that microbes increase with great rapidity after death, and pass readily through tissues which during life opposed their passage, also that in the cases of very severe infection the vessel walls are gravely damaged by the toxin. Moll found further that optico-ciliary neurotomy had no protective effect as regards the other eye, a fact which is deprived of some of its apparent importance, however, by a certain peculiarity in the nerve apparatus of the rabbit and guinea-pig.

Out of 36 animals infected, 14 were lost by excessive action of the injection, but of the remaining 22, 17 contained the bacillus in both eyes, and in all of these bacterial examination of the blood gave a positive result, while in 5 the dose seems to have been too small or the process too transitory to allow of the other eye becoming affected; in these 5 examination of the blood gave a negative result. Out of 20 control experiments in which the blood was infected but the eye was not subjected to cauterisation, 7 animals died, while of the remaining 13, 3 no doubt showed bacilli in the anterior chamber, but 2 of them were nearly moribund at the time; the remaining 10 animals had sterile aqueous humours, notwithstanding the abundant presence of the microbe in the blood. The bearing of all this upon the difficult questions of sympathetic inflammation and the preliminary irritation is not far to seek, since it appears that given a certain condition of the system generally, irritation of the ciliary nerves on one side is capable of setting up an exactly similar state of matters in the other. As above indicated, it has been shown by various observers that persistent irritation of one ciliary region is capable of altering the aqueous humour of the other eye, and if the lesion be severe enough and long continued, inflammation may occur; while if evil influences be circulating in the blood, true sympathetic ophthalmia is likely to come on. The long interval between the original mischief and the sympathetic inflammation is also explained, for after the injury the patient remains for a time—varying according to the persistency and the severity of the original lesion—liable to sympathetic ophthalmia, and should he be in a "toxæmic" condition, as Panas calls it, this is very apt to occur. In this way the onset of any fever is of great danger to a patient who has met with a "suitable" injury on account of the pathological condition of the blood, as has been long known. Moll concludes his paper with the advice that the blood of all such persons should undergo a careful bacteriological examination, which indeed seems a true corollary to the proposition which he believes himself to have established, and that treatment should be to some extent based on the results of that examination. The word "toxæmic" is of course somewhat elastic if not vague, and it is necessary for this theory that a toxæmic condition be set up, still the paper is of value and may help to bring us nearer to some understanding of sympathetic ophthalmia.

V. MORAX AND P. PETIT. Remarks upon the Clinical and Bacteriological Aspects of Acute Inflammations of the Conjunctiva. *Annales d'Oculistique, September*, 1898.

There are three well-defined inflammations of the conjunctiva, say Morax and Petit, each dependent upon a special bacillus, transplantation of which to another conjunctiva, will infallibly reproduce in it the same disease, of which two, viz., acute contagious and sub-acute conjunctivitis, are peculiar to that membrane, while the third, gonorrhœal ophthalmia, may affect other mucous membranes. Each of these has its own special organism, Weeks's bacillus, a diplobacillus, and gonococcus, respectively. To mucous membranes in general, and to the conjunctiva in particular, it is not a matter of indifference what organism it happens to be which sets up an attack of inflammation, as even some recent text-books seem to indicate; indeed it is to some extent quite feasible to make a classification of microbes based upon their greater or less aptitude to grow upon and to set up inflammation of mucous membranes. Looked at in this way there are three groups, the first including those which are conveyed from one mucous surface to another, require no other condition than their presence only to set up inflammation, and are not found on the normal membrane; such are gonococcus, diplobacillus, and Weeks's bacillus. The second includes those which are habitual inhabitants of mucous membranes, and which in presence of certain conditions not as yet fully ascertained, are capable of setting up inflammation; such are the pneumococcus and certain streptococci. The third includes those which are able to grow and set up inflammation only when the soil has been prepared by another infection; such are the diphtheria bacillus, staphylococcus, and some streptococci. Thus deposition of a culture of one of the first group upon healthy conjunctiva will certainly set up the corresponding variety of inflammation, of the second may or may not, and of the third will certainly not.

This failure on the part of the microbes belonging to the third category has been attributed to a germicidal action of the tears, but this antiseptic action, if it has any real existence, is only exercised towards certain germs, not towards all; it is incapable of defending the conjunctiva against the gonococcus, for example. While the gonococcus, diplobacillus, and Weeks's bacillus are able to penetrate the tissues themselves, if one wishes to set up an inflammation of conjunctiva or cornea with streptococcus or staphylococcus he must first make a wound and deposit the infective material in the tissues. It seems as if outside mucous membranes the three germs of the first group failed to find the albuminous substances necessary to their existence; if therefore we were able to prevent their transmission from one mucous surface to another, we could, speaking theoretically, stamp out the diseases which they induce.

A classification of conjunctivitis depending upon the demonstrated presence of certain microbes has been proposed, but any such attempt can only lead to error in the present state of our knowledge, since certain germs may be cultivated from the discharge which have no causative influence upon the disease; thus one dare not say in the absence of membrane on the conjunctiva that diphtheria is present merely because one has succeeded in demonstratnig the diphtheria bacillus in the exudation. Nor must it be forgotten that two infections may be present at one time, as when we infect a patient suffering from trachoma with gonorrhœal ophthalmia. Putting aside for the meantime other forms of conjunctivitis, the authors proceed to discuss three varieties in particular.

(1) Acute Contagious Conjunctivitis. By this term the authors mean that form caused by the bacillus of Weeks, though they admit that certain epidemics of acute contagious conjunctivitis have been definitely shown to have been caused by the pneumococcus. It is Weeks's bacillus which is responsible for the majority at all events of those epidemics of conjunctivitis in schools, houses, &c., so much so that the authors consider they are justified in employing the term in the manner indicated. It would be superfluous at this time to say anything regarding the symptoms, which are the same in Egypt, Europe, and America, in all of which it is to be found. Two points are worthy of note, viz., that a very mild case may give rise by contamination of another conjunctiva to a very severe one, and that one attack gives no immunity from another.

(2) Subacute Conjunctivitis. This form is due in the opinion of the authors to the diplobacillus, though all observers are not at one on this point. Biard in particular asserts that he found this diplobacillus in the nasal mucous membrane of twenty-eight persons out of thirty who were

not suffering from chronic conjunctivitis, and suggests that the germ is saprophytic and not a causative agent. Morax and Petit reply that this is an error of observation, and that they have in similar persons found a microbe very closely resembling the diplobacillus, but acting differently from the real one when grown on coagulated serum; the one microbe has been mistaken for the other. In a recent number of the *Arch. fur Augen.*, Bach and Neumann give the results of their inquiries whether, in a series of cases of conjunctivitis clinically precisely similar, the same microbes were met with with any approach to constancy. They examined 110 cases of catarrhal conjunctivitis, in 35 of which the diplobacillus was found; among these cases it was in a state of purity 5 times, 4 times with the bacillus of xerosis, 22 times with the staphylococcus, once with the pneumococcus, once with Friedländer's bacillus, and twice with the streptococcus. They diagnosed "Angular Conjunctivitis" 19 times, but it is important to observe that in 14 of these cases they failed to discover the diplobacillus. In short, as Bach and Neumann say, clinically identical appearances are associated with distinctly different organisms, while the same microbe is found along with clinical types entirely differing one from the other. But this is a fact which is constantly to be noted in bacteriological work, say Morax and Petit, as for example is the case with inoculations of fowl cholera, which according to its virulence may produce either various local lesions or death by septicæmia. Those other microbes present along with the diplobacillus can in their opinion have no *rôle* in the development of this conjunctivitis, for except the diplobacillus is there inflammation does not occur, while a pure culture of that microbe is capable of setting it up. Chauvel and others, however, fail to recognise clinically or otherwise the existence of this variety of conjunctivitis as a separate and distinct form, in spite of the authors' claim of a special clinical entity and of their successful cultivation and inoculation.

(3) Pneumococcus Conjunctivitis. A serious difficulty meets the observer at the outset in the fact that the pneu-

mococcus is found in the normal state as a saprophytic inhabitant of the conjunctival sac, but in the few cases in which the authors have seen this form of conjunctivitis, pneumococci were present in such numbers that it was hardly possible to question their active influence. What is the origin of these pneumococci ? Is it the same microbe which we see in infinitely small numbers in the normal sac, which under some unknown influence has become altered from a saprophytic into a pathogenic organism ? Or is this a special pneumococcus to be differentiated from the other, and which has acquired the property of vegetation and growth upon a healthy mucous membrane ? The opinion of the authors is that there may be two varieties of pneumococcus conjunctivitis, one which to be regarded as an auto-infection from a conjunctival lesion or lacrymal trouble, and which is not infectious : and a second, essentially contagious, caused by the entrance from without of a special pneumococcus. It is apparently the case that pneumococcus conjunctivitis is sometimes contagious and sometimes not. In an epidemic at Weimar observed by Axenfeld, there was no doubt as to the contagion, which it is interesting to observe was resisted by adults, though children were readily affected. Giffard, of Omaha, has succeeded in purposely producing pneumococcus conjunctivitis by direct inoculation, but he thinks that the oxygen of the air has a powerful inhibitory influence, and by rapidly diminishing the virulence of the culture causes the inoculation to fail in certain cases. There does not appear to be any marked or striking feature by which one may at once recognise this form of conjunctivitis clinically from the ordinary acute contagious conjunctivitis ; microscopic examination of the secretion is the only sure way.

[See also OPHTHALMIC REVIEW, 1898, pp. 323 and 335.]

SORGER (Bamberg). **Spontaneous Repeated Hæmorrhage from the Iris and Ciliary Body into the Anterior Chamber in a Case of Splenic Leuchæmia.** *Münch. med. Wochenschrift*, No. 35, 1898.

The case reported by Sorger occurred in a man who, till early in 1897, had been healthy and of active athletic habits. He then began to suffer from gastric symptoms and became jaundiced. When under Sorger's observation he had very numerous glandular tumours and a greatly enlarged spleen. He died in March, 1898.

The hæmorrhage occurred in the right eye, the condition of which when first seen was as follows: Some injection of conjunctival and episcleral vessels; anterior chamber too deep and filled with blood up to the upper border of the pupil; the blood seemed to be in layers of varying intensity of colour, the uppermost layer having a partially translucent and serous appearance. The fundus oculi could not be seen. V. = perception of light.

Atropine was applied, but the pupil did not dilate widely. The anterior chamber was tapped by a 4 mm. incision at the sclero-corneal junction; the contents slowly escaped; the pupil became contracted, and the iris, which had a brownish-red colour, showed on its anterior surface a number of large and small extravasations. While under observation the anterior chamber again became half filled with blood. Paracentesis was again performed, atropine applied and the patient kept in bed. Next day the blood in the anterior chamber reached to the lower pupillary border.

Repeated tapping was performed, and on each occasion streaky hæmorrhages on the front surface of the iris were visible after emptying the anterior chamber. The latter appeared abnormally deep throughout. Ultimately the bleeding ceased, the extravasated blood became absorbed, and vision improved. The last note of the ocular condition recorded vision $\frac{6}{6}$ nearly; aqueous quite free from turbidity.

J. B. L.

FRÆNKEL (Hamburg). Retinal Lesions in Leuchæmia Myelogenica. *Münch. med. Wochenschrift*, No. 28, 1898.

At a meeting of the Hamburg Medical Society, Frænkel exhibited specimens from the eye of a man who had died of leuchæmia myelogenica. In the retina were numerous closely set, often confluent bright-red hæmorrhages, immediately surrounding the optic papilla; in addition to these there were punctate extravasations situated more peripherally, and strikingly white patches, some of which were striated in appearance, continuous with the disc, and not unlike bundles of medullated nerve-fibres.

Frænkel questioned whether such changes in the fundus could be regarded as characteristic of leuchæmia; he held that they could not be so considered, and were not distinguishable from lesions met with in cases of pernicious anæmia.

In the discussion which followed, Deutschmann agreed with Frænkel, but added that he thought there was one ophthalmoscopic appearance which was characteristic of leuchæmia, viz., a peculiar orange colour of the fundus oculi, which may be present in cases without visible retinal lesions. The cause of this orange tint was uncertain; it might with probability be considered due to infiltration of the choroid with leucocytes, and it must mean that the retinal pigment epithelium became transparent. Pathological changes in this layer have been found in leuchæmia.

J. B. L.

GUNN. Localisation of Intra-cranial Tumours. *Brain*, *Autumn*, 1898.

At a discussion of the Neurological Society of London on this subject, Gunn alluded first to the fact of the very great frequency of optic neuritis in tumour, pointing out that in order of such frequency tumours of the cerebellum come first, then of the basal ganglia, then of the occipital, frontal, and temporo-sphenoidal lobes. He considers that the circumstances which chiefly contribute to its onset and severity are rapid growth, increase of cerebro-spinal fluid, and basal meningitis, these accounting for its particular disposition to occur in cases of cerebellar tumour. It is now well known that a certain type of neuritis, in which there is development of a stellate figure at the macula resembling that seen in albuminuric retinitis, is almost invariably a sign of cerebellar growth. He thinks it quite possible that unilateral neuritis or unilateral excess of neuritis may help in the localisation, though the mere presence of neuritis is of no localising value. Briefly put, his view is that the farther forward a new growth is, the greater probability is there that the neuritis may be either unilateral or at least worse on the same side. Thus there seems more likelihood that a tumour of the right frontal lobe may cause a right-sided neuritis than an occipital tumour, and certainly than a cerebellar one. As another possibility he suggests that minor anatomical differences in the orbit and its contents may predispose, and propounds the idea, also worthy of investigation, that differences in the refraction of the eyes may cause a difference, real or apparent, in the degree of ophthalmoscopic change.

ALEX. W. STIRLING, M.D. (Atalanta, Georgia). **Glaucoma, its Symptoms, Varieties, Pathology and Treatment.** Jones H. Parker, St. Louis. 8vo, pp. 176.

The contents of this volume are the outcome of a course of lectures at the Post-graduate School in New York, and form a very complete and concise *résumé* of what is known about glaucoma at the present time. The work might be perhaps somewhat improved by being less complete and less concise. Opinions and observations are quoted the value of which has been discounted many years ago, and in the endeavour to be concise the author has thrown in statements of other observers while describing some particular theory, in a way which makes the reader sometimes rather confused. But with these reservations the book will prove a useful addition to the literature of an important subject in ophthalmology.

The first part treats of the symptoms (including signs) and their explanation. All are attributed to the high pressure, if we except the papillitis which has been described by several observers as an early sign in this disease, and whose existence is not admitted by all authorities.

The theories of Mauthner, Ulrich, Donders, Weber and Knies are described briefly, and with somewhat too much interpellation of other observers' statements, complicating the description. Then comes Brailey's theory, the account of which leaves no definite idea in the mind of the reader, and finally Priestley Smith's, to which view the author himself adheres. Other theories are touched upon, Stellwag's Jacobson's, Nicati's, and the unusual forms of glaucoma such as buphthalmos and glaucoma in young persons and in aphakia and aniridia, are alluded to as well as the common types of secondary glaucoma.

The various operations undertaken for the cure of the disease are described pretty fully, the author laying most stress on the peripheral iridectomy, the iris being torn from its ciliary insertion rather than cut, in the method to which

Treacher Collins has given the old name of "iridectome-dialysis."

A good index and very complete list of biographical references adds greatly to the value of the book.

J. P. NUEL (Liège). Etiology and Pathogenesis of Anterior Polar Cataract. *Archives d'Ophtalmologie, January*, 1899.

The author has specially in view anterior polar cataracts —distinct from pyramidal cataracts—which consist of a small, well-defined circular, nacreous white spot, not projecting into the anterior chamber, having a diameter of from one to two millimetres, and situated at the centre of the pupil. These cataracts are usually considered to be of congenital formation. Nuel believes that they are formed in extra-uterine life, and usually follow ophthalmia neonatorum. His attention was drawn to this consideration by having happened to have under his care four infants with ophthalmia neonatorum, in whom anterior polar cataracts were made out at a later date. At the time of the blennorrhœa nothing abnormal had been noticed in the pupils, which had been carefully examined.

Subsequently, in two other cases, anterior polar cataracts were found (one, two months after the ophthalmia) in infants, who certainly presented nothing similar at the onset of the ophthalmia. In both these cases there had been corneal complications without perforation.

Pathogenesis.—The phlogogenic substances, secreted by the intra-corneal microbes, diffuse themselves in the aqueous humour, and set up iritis; at the pupil they come in contact with the lens capsule, not protected by the iris at this part, and penetrate to the capsular epithelium. The epithelial cells, still in full formative activity at this age, are irritated and proliferate, forming the laminated and fibril-tissue constituting the cataract.

At a more advanced period of life non-perforating corneal ulcers (unaccompanied by hypopyon) never give rise to the same disturbances of the lens, probably because the capsular cells are relatively inactive and less likely to proliferate when irritated. But if the lens, following a perforation of the cornea, comes against a cornea infiltrated with pus, then the inflammatory substances, coming more directly and in greater abundance against the lens capsule, may suffice to provoke formative activity and proliferation of the adult capsular cells.

The mere physical contact of the lens capsule with the cornea, mentioned more especially by Treacher Collins, would not provoke proliferation of the capsular epithelium. Besides, this contact does not occur in the form of anterior polar cataract without previous corneal perforation. Collins, writing on anterior polar cataract,[1] attributes their formation to contact of the cornea and the anterior pole of the lens and to an arrest in the osmose of the nutritional fluid to it in that position. The contact (when not congenital) may be brought about in infancy, when the anterior chamber is very shallow, by the swelling of the cornea, which is the accompaniment of inflammation of it, and need not necessarily be due to its perforation.

C. H. U.

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[1] "Researches into the Anatomy and Pathology of the Eye," p. 23.

GONIN (Lausanne). A Case of Pigmented Sarcoma of the Cornea. *Beiträge zur Pathologischen Anatomie und zur allgemeinen Pathologie, xxiv.*, 3. 1898.

Tumours of the cornea of any kind are very rare, and such as do occur, whether epitheliomata or sarcomata, seem to belong really to the conjunctiva, sub-conjunctival tissue, or the uveal tract. Rumschewitsch published in 1891 what is possibly the only previously recorded case of a sarcoma of the cornea arising primarily in that tissue; it was that of a man of 61, who exhibited a pedunculated or mushroom-like growth springing from the cornea; it was not pigmented. As in that case, so in Gonin's patient, a man of 32, there was a history of injury to the eye some time previously. In July, 1896, he had first noticed a small, rose-coloured "bouton" sprouting from his right cornea, which, after incision, rapidly re-formed, having at its centre a black spot. In September of the same year, the notes show that the growth was about the size of a pea, soft and fleshy, pedunculated and hanging from its base "like a tear running down"; it was entirely free from the limbus corneæ all round; it did not touch it. The vessels running to it came from the conjunctiva across a narrow but distinct band of unaffected cornea. The tumour was cut away, and the base destroyed with the Paquelin's cautery; up to the beginning of 1898 there had been no recurrence. Careful examination of the tumour left no doubt that it was a true sarcoma. At its base the sarcoma cells infiltrated the corneal substance and even ate into the epithelium itself, which, however, covered the whole surface of the growth, at least its external layer of flattened cells being present, though somewhat altered at parts; in most of the sections Bowman's membrane was seen to be absent, being broken up and destroyed by the compression and distension from beneath. The author promises to discuss in a future paper the question of the origin of the pigment present in the tumour: did it form as a degeneration of blood pigment, or was it produced anew *in situ?*

TIRARD (London). Albuminuria and Bright's Disease. *Smith, Elder & Co., London*, 1899.

This volume, the chief interest of which is for the physician, contains a chapter on "Retinal Changes in Bright's Disease." It is embellished by several coloured plates of the ophthalmoscopic appearances in renal retinitis, from drawings by Mr. Stanford Morton.

A treatise on Bright's disease would be very incomplete without a chapter on the ocular symptoms of this malady, and we are glad that the author of the book before us has devoted some pages to their consideration. It is only to this portion of his work that our notice refers; a review of the whole volume would be scarcely in place in an ophthalmic journal.

Tirard's statement that "in many cases of chronic Bright's disease retinal changes may be discovered . . . in the total absence of any apparent change of vision or of complaint concerning the sight," is surely quite contrary to the generally received ideas, and seems to us too emphatic. It is true that cases are met with in which retinal disease exists and is found by the medical man before the patient notices any defect of sight; but such cases are exceptional.

The author, we note with pleasure, draws attention to the changes in the retinal arteries, described by Marcus Gunn, the importance of which; as an indication of general arterial disease, should be widely known. These changes are often obvious in cases in which the usual retinitis has not developed.

In writing of the theories as to the causation of the retinal lesions in chronic nephritis, the author supports the hypothesis that high arterial tension is probably the chief factor in their production.

He is of opinion that "the diagnostic value of the various retinal changes is relatively small," and emphasises the fact that retinal lesions are not, in themselves, conclusive evidence of Bright's disease.

Concerning the prognostic significance of renal retinitis, the author has not expressed himself very clearly, although it is evident that he recognises the gravity of the ocular lesions as regards prognosis. He quotes from the valuable statistical paper by Miley (*Trans. Ophth. Soc.*, vol. viii.), but is inclined to the opinion that a prognosis based upon the figures contained therein is too gloomy.

If it is borne in mind that Miley's cases were all hospital patients, his figures may be taken as very nearly correct, and have been confirmed by subsequent investigators. Statistics as to the duration of life after the onset of renal retinitis compiled from cases not of the hospital classes, undoubtedly give a longer average of life; but it is completely established that the occurrence of albuminuric retinitis is, except in pregnancy cases, a certain indication of a fatal termination of the kidney disease at no distant date.

THERAPEUTIC NOTES.

Oily Solutions as Collyria.—There are two objections to watery solutions as suitable applications for the eye, viz., that in the first place they are apt to deteriorate by keeping and to become turbid, and to deposit cryptogamic products. The addition of an antiseptic to the solution, non-irritating and yet sufficiently powerful to prevent such changes, while at the same time it does not chemically attack the substance held in solution, will, of course, effect the desired end. But such is not easy to find, in our experience. In the second place, the instillation of a watery solution is sometimes much resented by an inflamed eye, especially when the patient is a child; the cold, harsh feeling to a tender eye of a watery solution, especially if it contains an antiseptic, is very unpleasant. In a case, too, in which there may be a deep ulcer of the cornea in a child's eye, the struggle between the patient and the guardian may result in a rupture of the thinned portion and a prolapse of iris, and so the cure may be worse than the disease. For these reasons Panas, like many others, has largely employed ointments containing the necessary alkaloids (atropin, eserin, &c.), but an objection to ointments is the difficulty of being sure of asepsis in a substance kept in an open pot. Latterly, relying on some careful experiments made on his behalf by Scrini, he has had oily solutions of atropin, &c., made from olive oil, and from oil obtained from the earth-nut, first scrupulously deprived of fatty acids by means of alcohol, then sterilised by heating to 120° C. When the temperature of the oil descends to 60° C. the alkaloid is introduced, and is at once dissolved. In the case of eserin, however, solution is first effected in ether, and this is then added to the oil, which must be no hotter than 45° C., because of the inflammability of such a mixture as oil and ether, and also because a higher temperature would conduce to the formation of rubreserine. An important feature of such solutions is that even in open bottles, exposed to air and dust, they remain for months transparent and undergo no alteration. Eserine solution in oil prepared as above does not change in colour as a watery solution does, not even when the oil used is one which absorbs oxygen, as for example linseed—a fact which tells against the usually current theory that the change is due to oxidation. To ascertain whether the oil had the property of rendering sterile such micro-organisms as it might contain, a long series of cultivations was made with various media, but all these were negative. It was still possible, however, that the germs in the oily solutions, although dead to all appearance when placed in bouillon, &c., might "come to life" when in contact with living tissue. Sub-conjunctival injections in the rabbit, however, gave the physiological action without any unpleasant result. If oily solutions kept in open bottles are so safe, how much more those preserved in well-stoppered flasks!

Experiment on men and animals has also shown that the actions of drugs are obtained just as satisfactorily and quickly as with watery solutions, and an additional advantage when using cocain is that the epithelium of the cornea is better preserved. This last is of importance alike when it is used before operation and in the course of painful ulcerative processes in the cornea. Such solutions can best be applied with a glass rod. It must be kept in mind that the hydrochlorate of cocain is insoluble in oil; the alkaloid itself should be used. It is but right to add that Panas is careful not to claim priority in the suggestion of oil as a menstruum for ophthalmic application.—Panas, *Archives d'Ophtalmol.*, June, 1898.

ARECOLINE AS A MYOTIC.—Arecoline is one of the alkaloids of areca nut, the seed of Areca Catechu, of which the author employs as a myotic the bromohydrate, a white crystalline salt soluble in water. Taken internally, its action is similar to pilocarpine; it is sialagogue, diaphoretic, and in larger doses, purgative. Applied to the eye in ½ per cent. solution it gives a very brief prickling sensation, but causes no ciliary congestion; in ten to twelve minutes its myotic action is at its height, lasting about an hour. At the same time contraction of the ciliary muscle occurs. The great advantage of arecoline over eserine, according to the author, appears to be the absence of any headache or other evil effects. He quotes Mr. Cross as saying, "I consider that arecoline hydrobromate is the best myotic which we possess for routine use."—Chetwood-Aiken (Truro), *British Medical Journal*, January 14, 1899.

OPOTHERAPHY IN OPHTHALMOLOGY. — It is now some little time since Dor, of Lyons, began to employ extract of ciliary body as a remedy in cases of cyclitis; now Lagrange has been using it along with a solution of vitreous humour, and has obtained "encouraging results." The substance, which he calls "Oculine," is prepared by mixing the ciliary body and vitreous obtained from the eye of the ox with sterilised glycerine; the mixture is kept together for six hours, being shaken at intervals, then diluted and filtered thoroughly. It is prepared in two strengths, suitable for administration by mouth and by subcutaneous syringe respectively. In an old man, who during extraction of cataract had a very severe loss of vitreous humour, the fluid was given, and eight months subsequently tension was normal, and there was no detachment of retina; vision was but poor, however, owing to the fact that he had suffered also from very severe iritis. In a child under similar circumstances good results were obtained. It was also administered in some cases of actual detachment of retina. In one of these, a girl in whom the lesion was of traumatic origin, and who only retained a fragment of the field and practically no vision, ʒiii. doses were given thrice a day by the mouth for one month; the result was excellent, the field of vision became nearly normal, only the lower portions of the retina remained detached, vision rose to $\frac{1}{8}$, and did not again deteriorate. It is to be noted, however, that during the time of treatment the patient was kept in bed; in a young patient with a traumatic detachment it is more than possible that a large part of the improvement may have been due to this circumstance. A second case did equally well, but in a third—a spontaneous detachment in a myope—there was no improvement to be recorded. In a fourth, results were better, vision rose from $\frac{1}{15}$ to $\frac{4}{5}$, and the field of vision expanded to its normal limits.

Lagrange states that he is carrying opotherapy still further by administering subconjunctivally, in cases of corneal opacity, a fluid obtained by macerating in distilled water the fresh cornea of the ox. Surely this hobby will be ridden to the death now! — Lagrange, *Gazette Hebdomadaire des Sciences Médicales, Bordeaux*, Sept. 25, 1898.

AIROL IN OPHTHALMIA NEONATORUM. — Villard brings against the usual nitrate of silver treatment of purulent conjunctivitis in infants the indictments that, though its results are certainly of the best, it is painful, it increases the swelling of the lids, it tends to the formation of membranes on the conjunctiva, and that there is a certain amount of danger in its application by unskilled persons. Nitrate of silver is a powerful weapon, but it is double-edged. Aware that airol was a very valuable application in gonorrhœa, he resolved to apply it in cases of ophthalmia; this he does in the form of an ointment of 2 to 3 per cent. made with vaseline; this is introduced into the eye two or three times a day. The insolubility of airol prevents its use as a lotion, so the ointment is employed in association with a solution of permanganate of potash, 1 to 6,000, or weaker, with which the eye is washed every hour or so. It seems that the first effect of the application of the ointment is to cause an abundant flow of yellowish secretion from the eye, which stains linen; this is accompanied by a good deal of swelling of the lids, which, however, does not last long. On opening the lids after this ointment has been in place for some time the palpebral conjunctiva is seen to be covered with a fine pellicle—a superficial eschar—the removal of which seems to cause the child violent pain. These symptoms, Villard hastens to assure us, occur only at the commencement of the treatment. He thinks it probable that airol acts by giving off free iodine, but however that may be, its two distinguishing features are efficiency and harmlessness. It may be briefly said that even M. Villard's own cases do not encourage one to desert silver nitrate.—Villard (Montpellier), *La Clinique Ophtalmologique*, Nov. 25, 1898.

AIROL IN HYPOPYON KERATITIS.—Bonivento has obtained good results in the use of airol in hypopyon keratitis; he cleansed the ulcer thoroughly with an antiseptic lotion, and then applied airol in the form of a powder ; he describes it as non-irritating. He used it also in gonorrhœal conjunctivitis with great benefit, but found that in trachoma with pannus it caused too severe irritation and had to be discontinued.—*Klin. Therap. Wochenschrift* ; quoted in *Merck's Archives*, January, 1899.

SALICYLIC ACID IN GRANULAR CONJUNCTIVITIS.—In the milder forms of trachoma, Moty, who has had long experience of the disease in Algiers and elsewhere, finds no mode of treatment so satisfactory as the application of salicylic acid, which he employs in the following manner. A pad of cotton wool mounted on the tip of a metal probe is soaked in a 10 per cent. solution of the acid in alcohol, then half dried to avoid "spreading," and with it the affected areas are lightly but firmly touched, they being first dried with a moist pledget ; any excess there may be is carefully mopped away. The acid used in this manner seems to act much like nitrate of silver, whitening the points where it touches the conjunctiva, but the pain caused is of very brief duration, so that its persistent use is more readily submitted to by patients. The cornea, too, tolerates the application well, and of course no pigmentation results from even long-continued use. Salicylic acid may be applied once a week in this fashion, or even as often as daily according to the severity of the case, without any harm resulting, and M. Moty does not find that any supplementary treatment is needed. He obtains immediate improvement in many cases—an improvement which increases as the treatment is carried on.—Moty (Lille), *Gazette des Hospitaux*, Paris, Nov. 22, 1898.

LARGIN.—Welander, of Stockholm, speaks strongly in favour of largin, one of the newer silver compounds, as an application in gonorrhœal conjunctivitis; in one case in particular he made careful daily examination of the secretion, and found the gonococci rapidly diminishing under the treatment. He considers both largin and protargol to be of great value.—*Archiv fur Dermatol. und Syphil.*, xlvi., 3, 1898.

PROTARGOL.—Protargol has now fairly taken its place as a valuable addition to the pharmacopœia of the ophthalmic surgeon, and the papers written regarding it are somewhat numerous. Messner gives his experiences with it as employed against various affections of the eye in a brief article. He used it in watery solutions of 5 per cent. as a rule, though he also tried 2 per cent. and 10 per cent. strengths as well; in this form it was employed as a lotion from three to five times a day. The disease in which it gave its very best results was dacryocystitis, either acute or chronic; by means of an Anel's syringe he washed out the sac with protargol solution after slitting up the canaliculus; in one of his cases which had been discharging evil-smelling pus for four years, he obtained a cure with wonderful rapidity. In ophthalmia neonatorum it proved very useful, and not less so in two cases of gonorrhœal conjunctivitis in the adult. In such cases the opinions of all observers are by no means uniformly in its favour. In trachoma, at least when there was a good deal of discharge, protargol acted well, but Messner admits that it can by no means be regarded as a specific in that condition. At first he did not feel much pleased with the drug in cases of acute conjunctivitis while he used it in watery solution, but later when he adopted a 5 per cent. ointment, protargol seemed to give greater satisfaction; here again he thinks it of little or no use when the secretion is watery, but more useful the more purulent the discharge. In the treatment of hypopyon keratitis, his estimate of the value of protargol is very low indeed.—Adolf Messner (Klagenfurt), *Centralblatt für praktische Augenheilkunde*, Jan., 1899.

FOLLICULAR CONJUNCTIVITIS AND ECCHYMOSIS OF THE CONJUNCTIVA CAUSED BY LONG-CONTINUED USE OF HYDROCHLORATE OF COCAINE.

By W. Koster, M.D.

Professor of Ophthalmology in the University of Leyden.

Few drugs used in medicine can, like cocaine, boast that they are extremely useful and at the same time that they rarely do harm. Now that we have learned that for subcutaneous injection the solution can be at least ten times weaker than for application to the mucous membranes, it is highly probable that no more cases of intoxication with fatal results will be reported. I am myself exceedingly thankful for the introduction of cocaine into ophthalmic practice, and am sorry, therefore to have to utter a warning against its use for certain purposes.

I have long noticed, as others must have done, that after continued use of cocaine the blood-vessels of the conjunctiva grow weaker, and that small conjunctival bleedings are frequently the result. The effect upon the vessels is then the reverse of that which is observable at first: their size is increased instead of being diminished. I have also several times observed in patients who had been treated with cocaine daily during some weeks, that the ordinary follicles were visible in places where we are not accustomed to see them, namely, in the upper fornix and in the conjunctiva of the upper lid. Still, as many people suffer from this follicular conjunctivitis, it was not easy to decide how far it was a result of the cocaine.

A striking case presented itself to me some months ago in which there could be no doubt that the cocaine was really the cause of the conjunctivitis, and in which the incessant rubbing of the cornea by the follicles in the upper lid caused the patient a good deal of suffering.

Mrs. N. suffered in March, 1898, from some eye trouble, probably a slight catarrhal conjunctivitis. She was treated apparently by the ordinary means. A week or two later, as there was no improvement, cocaine was prescribed for use at home. This was used frequently, and gave some relief, but did not cure. The redness of the eyes increased, and there was much pain. Things went from bad to worse, and in November of the same year she presented herself to me. The appearance of the eyes was really alarming. The ocular conjunctiva had an intense brownish red colour, and was slightly swollen. This depended on numerous small spots of ecchymosis. The conjunctiva of both lids was hyperæmic and covered with follicles of the ordinary size and appearance. The unusual presence of follicles in the upper tarsal conjunctiva led me to the conclusion that the cocaine might be the cause of the disorder. The corneæ were clear; no other abnormalities were found; vision was normal in both eyes. I advised the patient to discontinue the cocaine, which she did, though unwillingly, and to use a solution of sulphate of zinc, 1-600. Ten days later *all the follicles had disappeared*, and the conjunctiva was paler. Under treatment by massage with an ointment of boric acid and vaseline, 1 per cent., the normal appearance of the eyes was restored in a month.

This case has convinced me that cocaine can cause follicular conjunctivitis, the characteristic of this special form being the presence of the follicles in the upper part of the conjunctival sac, and especially on the tarsus. It also illustrates the bad effect which the continued use of cocaine may have upon the blood-vessels. It enforces the need for care as to the use of cocaine for trivial feelings of discomfort in the eye, and especially as to giving this drug into the patient's own hands.

G. LEVINSOHN (Berlin). On the Question of a Continuous free Communication between the Anterior and Posterior Chambers. *Zehender's Klin. Monatsbl. f. Augenheilk., February*, 1899.

That the aqueous humour is secreted by the ciliary processes and passes continuously from the posterior to the anterior chamber as it is drained away from the latter by the spaces of Fontana, is almost an axiom of modern ophthalmology. It is at least somewhat surprising to find it disputed on the ground of a physical obstruction to the passage of fluid from the one chamber to the other. Yet such a thesis has been recently maintained by Hamburger before the Physiological Society of Berlin (*Centralbl. f. Pract. Augenheilk.*, August, 1898); and in the paper before us Levinsohn examines the grounds on which he bases so remarkable a conclusion.

Hamburger's primary contention is that the iris and lens are not simply in contact but are pressed together by the normal intra-ocular pressure; and while Levinsohn is prepared theoretically to admit this, and even suggests that in glaucomatous eyes it may be one of the factors in causing the sluggish movement of the pupil; in an eye of normal tension he thinks this pressure is quite inconsiderable, as witness the extreme mobility of the iris over the lens. Not only does the curtain of the iris slide freely in a sagittal plane; the wavy movements communicated to it by the lens in cases where the suspensory ligament is defective show its free mobility also in an antero-posterior direction. If the iris were constantly pressed forward by the lens then it is just in these cases that we should expect the mobility of the iris to be diminished rather than increased because the thickness of the lens is greater when the tension of the suspensory ligament is relaxed. Levinsohn rejects also the idea that the tonus of the sphincter will keep the pupillary portion of the iris especially closely pressed against the lens, since the fibres of the sphincter lie entirely in the plane of the pupil and can exert no pressure whatever in any direction other than in that plane.

As far as theoretical considerations go, then, the author considers that Hamburger has in no way shaken the position originally taken by Leber, that the iris simply rests on the lens and the slightest force is sufficient to separate them.

Turning next to the experimental evidence, Koster was the first to test the points in dispute by injecting a coloured fluid directly into the posterior chamber, with the object of ascertaining how soon it would reach the anterior chamber; and he found that twenty-four hours might elapse without any trace of it becoming visible in the latter. He used a strong solution of Prussian blue, and to avoid the objection that the colouring matter in this is particulate and not really in solution, Hamburger repeated the experiment, using a 20 per cent. solution of fluorescin. "The pupil remains perfectly black five minutes, ten minutes, a quarter of an hour. Then suddenly, in a most surprising manner, bright green clouds are seen to rush forward, as if one had drawn off the contents of the posterior chamber by opening the anterior, that is to say, by a relaxation of the tension of the iris." (Hamburger.)

Levinsohn's objection to both Koster's and Hamburger's experiments is that it is extremely doubtful whether the fluid was injected into the posterior chamber at all. He has repeated Hamburger's procedure exactly, piercing the eye of a guinea-pig 2 mm. behind the corneal margin with a fine syringe, pushing the latter in parallel with the iris and then slightly forwards till it reached the back of the latter, injecting a minute droplet (2 to 10 cb. mm.) of the fluorescin, and withdrawing the syringe. In most cases the pupil remained uncoloured. In some of these he found after enucleation that the fluid had entered the lens; in others the escape of a bead of vitreous on withdrawal of the syringe showed that it had been passed into the vitreous. He did, however, succeed in some cases in injecting the fluid directly into the posterior chamber without any loss of aqueous. "I inferred that I had succeeded from the fact that the moment after the injection the whole anterior chamber suddenly became green." Occasionally the pupil became coloured only after the lapse of two or three minutes; but in these cases, too, he thinks it may perhaps be accepted that the fluid was really deposited in the posterior chamber, for the normal nutritional currents are only slow, and it is possible that in injecting the fluorescin and withdrawing the syringe the ordinary pressure was not raised, but might even be lowered, so that only the normal, or even a sub-normal, nutritional current was at work to carry the fluid from the posterior to the anterior chamber. Hamburger's experiment, then, in Levinsohn's hands, turns rather against than in favour of his hypothesis.

Further, if we accept Hamburger's view that the anterior chamber is equivalent to a closed space deriving its contents only from the secretion of the anterior surface of the iris, we are met at once by the difficulty of explaining on this theory the occurrence of secondary glaucoma from closing of the pupil. He is evidently alive to this objection and meets it by the suggestion that, while under normal conditions there is no current from the posterior to the anterior chamber, yet under abnormal ones, such as those due to inflammatory processes, there may be such a current, and its stoppage may give rise to increase of tension; and he brings forward an experiment in support of this view. If one eye of a guinea-pig be dislocated from its socket, maintained in this position for about eight minutes and then replaced, and a solution of fluorescin be injected into one of the systemic veins, it will be found that the colouring matter presently appears in the pupil of the eye that was dislocated, while nothing of the kind occurs in the other.

But this experiment, says Levinsohn, does not in the remotest degree reproduce the conditions under which secondary glaucoma occurs. The latter is not the accompaniment of an acute inflammatory process, but occurs as a rule when all traces of inflammation have disappeared. The experiment he thinks is calculated to produce an increased rapidity of the normal nutritional currents of the eye and nothing more; that is to say, the luxation of the globe causes obstruction of the veins, these are correspondingly dilated, and when the obstruction is removed they aspirate the fluid from the anterior chamber, while the secretion from the ciliary bodies still remains above the normal. The state of things is, in fact, similar, though slighter in degree, to that produced by puncture of the anterior chamber.

Without entering into the general question the author considers that he has said enough to show that Hamburger's views on the secretion and removal of the aqueous humour must be rejected as unfounded.

W. G. L.

PFALZ (Düsseldorf). The Appreciation of Space in Binocular and Monocular Vision. *La Clinique Ophtalmologique, January*, 1899.

It is chiefly by virtue of our convergence that we judge of the actual and relative positions of objects, knowing that if the situation of an object requires us to exert a considerable degree of muscular action, it must be near to us, and we project all objects as though we regarded them with a central cyclopian eye. Other circumstances also assist, *e.g.*, the degree of accommodation employed, and the difference between the two images, but the estimate of distance is most largely made by our knowledge of the degree of inclination of the optic axes. But the special point to which Pfalz directs our attention at present, especially in connection with medico-legal questions, is the appreciation of distance and projection possessed by a person with only one eye, in whom manifestly the last of these three means is absent, and after a certain age the second also. He is of opinion that a one-eyed patient—and it is well-known that these often project with great skill and exactitude—acquires an extraordinary precision in judging relative distances by dint of high cultivation of his power of judging actual distance. He is assisted further by the monocular stereoscopic parallax, and by his knowledge of the "angle of projection," the angle, namely, which is enclosed at the distance of the object between the visual line of his only eye and the line of direction of his theoretical cyclopian eye; this angle is of course equal to that between his line of actual direction and his line of straightforward gaze—in other words, his angle of convergence, monocular though that be. It seems that a one-eyed person, according to Pfalz, prefers to look at an object as though he still had two eyes, keeping it in front of his cyclopian eye rather than having it along the "gaze-line" of his own single eye. The monocular parallax is created by those patients by means of slight movements of the head, the relative situations of two objects thus becoming altered. The perfection to which this monocular means of knowledge of distance can be carried varies much in different individuals, and that it can be acquired to a wonderful extent unconsciously is manifest when we recollect how a patient may gradually lose the sight of one eye and yet never be aware of the smallest difficulty in this respect. Pfalz has devised a little instrument for the examination of the amount of skill in this direction which a patient possesses, based upon Hering's test, and which also enables one to detect simulation; for a description of it the original paper must be referred to. The loss of this power of correct projection in space, and the consequent danger to a workman dealing with edge-tools, &c., is a very important feature in the question of compensation for the loss of an eye, and it is with this that the last portion of Pfalz's paper deals, believing as he does that the formulæ hitherto in use require some revision. The divergence of opinion among surgeons as to the reduction in working power caused by the partial or complete loss of one eye is very great; Groenow, Magnus and Zehender all giving different formulæ for the calculation. Lately careful study has been made of the conditions of work among one-eyed persons, and in Pfalz's judgment this is the line to follow in coming to a decision. He thinks that besides testing the amount of central vision, field of vision, mobility, &c., of any injured eye, one ought to pay special heed to the "sense of space," and the possibility of binocular vision; in the case of unilateral injuries, he says it is every whit as important to ascertain the condition of this function as to know whether the acuity of vision is $\frac{1}{2}$, $\frac{1}{8}$, or what not. He finds that binocular vision and binocular calculation of space exist unaltered even when in one eye the acuity of vision is reduced so low as $\frac{1}{10}$; this he has established by the examination of a number of persons of unimpeachable honesty. So, rather despising the mathematical formulæ of Magnus and others, he concludes: The vision of the better eye being normal and the sense of space normal and binocular, the working capacity is also normal, even if the visual acuity of the other eye reaches only $\frac{1}{10}$. If this principle were once admitted by experts, he believes that difficult cases of litigation for compensation would be rendered more simple, there would be less conflict of skilled evidence. The same is true in the case of an only eye, where the estimation of the existence of sense of space and its accuracy gives much help in determining the amount of compensation which would be just, and also in deciding as to the *bona fides* of the claimant.

ARTHUR L. WHITEHEAD (Leeds). The Ocular Phenomena Associated with Cheyne-Stokes Respiration. *Lancet, February* 25, 1899.

The title of this paper is perhaps a little misleading, for it is founded on the observation of two cases in which Cheyne-Stokes breathing was not present. But Whitehead's contention is that there may arise what he calls a Cheyne-Stokes state, showing itself in an alteration of the rhythm of respiration or similar function, alone or in combination. In his two cases, one of localised meningitis following on ear disease and one of subdural abscess involving the right lobe of the cerebellum, the peculiar cycle of respiration was not present, but the following curious series of pupil changes took place in each. At the commencement of the cycle the pupil diameter was 1·5 mm., slowly and gradually it dilated to 5 mm., then as slowly contracting again, these changes taking about fifty seconds; then followed a pause of a few seconds, and the cycle began again. At no period was the light-reaction interfered with, nor was there any nystagmus, deviation of the eyes, or respiratory alteration. Whitehead gives a useful *résumé* of the pupil changes and alterations in eye movements which have up to now been noticed along with Cheyne-Stokes breathing; these have consisted of extreme variations in the size of the pupils, nystagmus, conjugate movements in various directions, loss of light-reaction, and strabismus. He believes these two cases of his to have been examples of ill-regulated action of lower centres when freed from control of the higher, analogous to what appears to be the pathology of Cheyne-Stokes breathing, only in this class of cases affecting the (lower) centres for movement and regulation of the eyes in place of those for regulation of respiratory action; in certain cases the two regions may be both affected.

E. E. MADDOX (Bournemouth). Tests and Studies of the Ocular Muscles. *Bristol: John Wright & Co.*, 1898.

As an original worker in the subject of which this book treats, the author is widely known. We owe to him some of the best tests by which the movements and equilibrium of the eyes are generally examined. In the present volume he has set forth, within short compass and in a very lucid manner, a number of the more subtle questions which relate to the motor mechanism of the eyes. We can here notice only a few points of interest and importance, which in the ordinary text-books are discussed scantily, if at all.

The first half of the book is chiefly anatomical and physiological. Chapter i. gives, among other matters, a full account of the common aponeurosis of the orbit—the complex framework of connective tissue which invests all the separate structures, extending from one to another, and splitting in such a manner as to encapsule each in turn. Of special interest in relation to the present subject, are the portions of this fascia known as the check ligaments. They serve to slow off the movements of the eye towards their limits, so as to avoid shock to its contents by a sudden arrest. An excursion of the eye does not cease, when it reaches its limit, because the globe itself is incapable of further rotation, nor yet because the muscle has attained its maximum contraction, but because the check ligament opposes a direct resistance to further shortening of the muscle. The internal rectus, for example, may be regarded as ending anteriorly in two tendons, the inextensible one, which is attached to the globe, and another highly extensible tendon which is attached to the orbital margin. When the muscle begins to contract the force acts almost entirely on the globe, but as the contraction continues it is transferred more and more to the check ligament, until at last nearly the whole of it acts on the rigid bone of the orbit; the movement is thus limited less by impediments acting against the eyeball itself, which would tend to distort it, than by a check on the moving force.

In chapter ii., which deals with ocular motions as distinguished from the action of individual muscles, that element in a compound movement to which the term false torsion is given, but which might with more propriety be termed physiological torsion, is discussed. Torsion, of course, means the rotation of the eyeball about its own fore-and-aft axis. When the eye, starting from the primary position, rotates so as to direct its visual axis towards a point lying vertically above or below the primary fixation point, or horizontally to either side of it, there is no torsion, but when it turns towards any other point, some degree of torsion is an essential component of the movement. In every oblique movement, as in looking, for example, upwards and to the right, the visual axis takes the shortest possible cut to its new direction, for the shortest cut occupies the shortest time to traverse. Every such oblique movement from the primary position is what may be called a purely rocking movement; collectively, all such movements might be produced if the eye were provided with an infinite number of recti attached around the globe, each infinitely thin, and one only acting at a time. Every such movement is actually produced by the combined action of at least three muscles. The nature and the degree of the torsion involved in an oblique movement of the eye may be variously estimated according to the various points from which it may be observed. The best plan is to observe it under all circumstances from the point towards which the eye is directed, and to define it accordingly. Maddox describes and figures a simple torsion measurer of his own devising—a graduated card with a plumb line suspended from the extremity of an axis perpendicular to the card. By means of the scale and the plumb line the amount of torsion proper to any oblique position is clearly indicated.

Chapter iii. deals with the individual muscles. Why is one muscle and one only, the superior oblique, furnished with a pulley? A certain degree of contraction demands a certain length in the belly of a muscle, and if both obliques were constructed on the pattern of the inferior oblique, a sufficiency of action could only be obtained by an overlapping of their insertions. That the advantage in point of length and efficiency is given to the superior oblique may be due to the fact that this muscle is used in looking downwards, while the inferior is used in the less frequent and less prolonged act of looking upwards.

In discussing the co-ordinated movements of the two eyes the author says: "The number of conjugate innervations is at present unknown. Five have long been recognised; one elevates both eyes, another depresses them, a third turns both to the right, and a fourth both to the left. The fifth is the converging innervation. Besides these five I imagine there may be three which govern torsion, and two which regulate the vertical balance of the eyes." It will be noticed that, like many other writers on this subject, Maddox makes no suggestion of an innervation antagonistic to that for convergence—an innervation for divergence, or more accurately for diminishing convergence. But is it not highly probable that the co-ordinated act of convergence is balanced by a co-ordinated act of the opposite kind, just as in the case of the compound movements to the right and left? It may, of course, be objected that we have no power of positive divergence, but the objection is invalid, for such a power would under normal conditions be absolutely useless; moreover, under certain abnormal circumstances we *can* voluntarily effect a slight divergence of the optic axes. The normal range of the co-ordinated act here suggested lies between maximum convergence and parallelism; the act of diminishing convergence may, we think, be as reasonably attributed to a conjugate innervation as may that of increasing convergence. Cases which appear to depend on isolated paralysis of this innervation have been recorded.

The more physiological part of the book concludes by a discussion of "motor faculties," under which heading are grouped fixation, direct and indirect, the fixation reflex, physiological diplopia, the suppression of images, fusion power, and perception of distance and relief. A handy form of cheap stereoscope, made by Baird, of Edinburgh, is figured. For the perception of relief, no stereoscopic test is clinically so satisfactory, in the author's opinion, as Hering's drop test, for in most others we have to rely upon the patient's statements without being able to verify them in the same unmistakable way.

Passing next to pathological conditions, Maddox devotes a chapter to strabismus. Touching the nature of the amblyopia he says, "That which is due to disuse can, I think, to some extent be distinguished from the congenital element by a considerable difference in the visual acuity of the outer and inner halves of the retina, so that if the surgeon holds up both hands simultaneously, one on one side and the other on the other, while the patient looks straight forward, the movements of the outer hand appear much more vivid to the patient than those of the inner, for the probable reason that the inner half of the retina, since it looks outwards, has been less disused than the outer half." The treatment according to the principles of Javal, of the secondary visual disturbances which play so important a part in the development of strabismus, is advocated.

In the chapter dealing with ocular paralyses, numerous charts are given to exhibit the nature of the diplopia in various forms of deviation, and the manner in which the diplopia may be graphically registered. A special chapter is devoted to mnemonics for this complicated subject. The employment of ophthalmoscopic corneal images in determining the presence of a deviation of the eye is fully discussed, and is illustrated by photographs from actual cases. These, while interesting as illustrations of the author's ingenuity in overcoming difficulties, appear to have hardly sufficient definition for the purpose of scientific record; probably this applies, however, more to the reproductions than to the original photographs, but the difficulty of obtaining these must prohibit their frequent use.

In a chapter on suppressed squint or heterophoria, Maddox commends the newer terms suggested by Duane—superable and insuperable squint. The word squint, however, has a decidedly pathological significance, whereas some amount of heterophoria is far too common to be regarded, at least on this side of the Atlantic, as a pathological state. The word heterophoria aptly expresses the tendency in question, and the other words expressing its varieties, as formulated by Stevens, are certainly very convenient, when we require something more specific than the general term, latent deviation.

Among the most interesting and least familiar questions with which the book deals are those relating to torsion—its measurement, its amplitude under normal and abnormal circumstances, and the effect which latent errors of torsion may exert upon the character of the diplopia which occurs on the advent of paralysis of one or other muscle.

The final chapter is headed "The Eye in Darkness." It deals with the curious problems concerning the behaviour of an eye placed in total darkness, while its fellow is still actively engaged in near vision, problems which the author has solved by his well-known visual camera.

An appendix is added, for the sake of reference to certain points in the Bowman lecture for 1898.

The book is exceptionally well illustrated with explanatory diagrams and figures of various instruments. The only slip which we have noticed relates to Priestley Smith's heteroscope, in speaking of which the author assumes an inaccuracy which does not really exist—the correctness of the angular measurements given by the instrument is not really affected by variations in the distance between the centres of the eyes.

The book is certain to be welcomed by all who are interested in the problems with which it deals.

E. RAEHLMANN. Blepharitis Acaria. *Zehender's Klin. Monatsbl. f. Augenheilk., February*, 1899.

Raehlmann finds a hitherto unrecognised cause of blepharitis in the presence of the demodex folliculorum. These little animals appear to be pretty frequent inhabitants of the hair-follicles of the eye-lashes. They may be found there in all stages of development, eggs, embryos, larvæ, and adults of both sexes. The blepharitis to which they give rise does not appear to have anything very distinctive about it; there are redness and swelling of the lid-margins, with crusting about the roots of the lashes, falling out and irregular growth of the latter, and subjective feelings of itching and discomfort. Balsam of Peru (diluted with three parts of lanolin) is the specific treatment advised for killing the acari; and the author's cases certainly seem to have improved rapidly under its use. One might almost say that they improved *too* rapidly, for whereas the symptoms were relieved in two or three days, living acari could still be found eight or more days afterwards. It is difficult to avoid the suspicion that the acari were merely an accidental accompaniment of an ordinary blepharitis, especially as the author admits that they may be found in some cases where the lid margins are apparently normal.

W. G. L.

HENRY POWER. Secondary Cataract. *St. Bartholomew's Hospital Reports, vol. xxxiv.*, 1898.

H. KNAPP. Operations for Secondary Cataract. *Transactions of American Ophthalmological Society, viii.*, 2, 1898.

The occurrence of secondary, or to speak more accurately, after-cataract, is regarded by different surgeons with very different feelings. Gayet, for example, was stated by Dufour to dread no operation more than that required for this condition, while Knapp performs division of the membrane in 74 per cent. of his cataract patients without the loss of a single eye. There is grave divergence of opinion, too, in regard to the most suitable time at which to interfere, supposing that operative intervention is agreed upon ; some considering that a fortnight between the primary and the secondary operation is long enough time to elapse, while others, including Mr. Power himself, prefer to wait much longer. To quote his own words, "The operation should not be undertaken at too early a period for several reasons." In gouty persons, he goes on to say, the eye will often not bear two operations soon after one another ; secondly, in healthy eyes absorption to a considerable extent may be expected to take place ; and lastly, "division of the lens and posterior capsule has little more effect in obtaining a clear pupil than the division of so much paste or boiled tapioca would have, since there is little or no elasticity in the softened lens substance, whilst portions of this material are likely to be pressed into the vitreous, in which case the absorption is very slow. . . As a general rule, at least from eight weeks to three or four months, or even a year, should be allowed to elapse before the operation for secondary cataract is undertaken. . . I do not think a year at all excessive."

Nearly every surgeon appears to have his own particular method of performing the operation also, for some use Bowman's double needle method, others employ such a knife as Graefe's or Knapp's. Mr. Power's favourite method is as follows: he employs a "very long, very narrow, and very sharp double-edged knife, bent at an angle approaching a right angle, with the handle like an iridectomy knife. The length of the blade is half an inch, and the width one-eighth of an inch. . . The point of the knife is made to penetrate the upper part of the cornea near its margin. The blade is pushed forward till it reaches and passes behind and beyond the pupillary border of the iris. By a lateral movement of the handle of the instrument the cutting edge divides the capsule near the attachment of the suspensory ligament." When this is insufficient, a Tyrrell's hook may be introduced, engaged in the little aperture thus made, and gently drawn upon so as to enlarge the opening. This latter manœuvre is not one which at all commends itself to our judgment, it is a reversion to the evils of the one-needle method upon which Bowman so much improved; one knows what he is doing fairly well with a knife or with two needles, but not with an unsupported hook.

As it appears to us, and as Mr. Jessop who puts the matter very clearly, states in his little hand-book, there are two forms of after-cataract, one of which is simple and non-inflammatory, consisting entirely or almost entirely of the remains of the capsule of the lens; the other is inflammatory and is formed by the exuded material from an iritis, united with thickened lens capsule and blood clot. Obviously the treatment of and the prognosis regarding the one cannot be the same as in the other case. In the first, the resistance is so extremely slight that there is really no danger in dividing it with such an instrument as the (so-called) Knapp's knife; provided one's instrument is clean and the patient in good health, there is no possibility of dragging on the ciliary processes. But an operation on a case of the second variety should not be too lightly undertaken, and probably the best instrument with which to perform it is either a small Graefe knife, or if the tissue is too tough for that, iridotomy scissors. In such a case there is very real danger from dragging on the ciliary attachment of the membrane; it is apt to be followed by severe hæmorrhage, or by persistent iridocyclitis. In the case of the first variety, there is no need to wait after the eye has lost the slight redness which always follows the cataract operation, indeed some hold that the earlier the second procedure follows upon the first the safer it is, and operate by preference about a fortnight after the extraction if the eye is quiet by that time, as indeed it usually is. In the second variety, on the other hand, the longer one postpones the better; the only exception to this is when the tension of the eye is either too high or (perhaps) too low.

Knapp lays down a rule which certainly it is safe to follow—"*Do not tear, cut.* Parts that cannot be cut are not for needle or knife, but for scissors, in or outside the eye." He does not definitely say, but he appears to operate about six or eight weeks after the extraction, and in suitable cases, that is, where there is a definite veil in the pupil, is much in favour of the performance of division of the membrane.

COLLINS' BIG TYPE ARITHMETIC.—The air at present is full of questions relating to the visual powers of school-children, and of all that tends to bring on school-myopia, school-headache and asthenopia. It may be taken for granted that if a child has difficulty in deciphering the type of his arithmetic book he will find it still less easy to "do his sums," than if he were not so handicapped. Messrs. Collins, the well-known educational publishers, have then done well to produce a "Big Type Arithmetic" in various series for the use of young children, in which the type is large and bold, as all printed matter for the use of children ought to be. Those in charge of schools, especially elementary schools, would do wisely to adopt them. They are a decided improvement on the older style of school book.

PIESBERGEN (Stuttgart). Vibration Massage of the Eye. *Centralblatt für Augenheilkunde, February,* 1899.

Piesbergen states that in the Hippocratic writings the principle is laid down that, in addition to many other things, the surgeon ought to have some experience in massage, and that it was successfully used is proved by the second proposition, "The massage is able to break up adhesions." (This refers to its use in joint troubles.) He also tells us that massage is mentioned by the late Greek writers, Aetius and Paulus of Aegina having employed it in certain eye diseases. Massage of the lids in old times was frequently used for trachoma.

Pagenstecher, among recent ophthalmologists, was the first who methodically employed massage; he published his results in 1878 and 1881. He only used effleurage—circular and radial quick rubbings, without strong pressure on the globe. He recommended it for corneal opacities, for pustular conjunctivitis and spring catarrh, and also for scleritis.

Reduction of intra-ocular pressure was observed, and subsequently demonstrated by Gradenigo.

In 1880 Junge, Chodin and Becker employed massage after discission in order to produce a more rapid absorption of the lens masses. Later the favourable effects of massage was confirmed in publications by Pedraglia, Klein, Schenkl, Czapodi and Dantziger. Others also used it in parenchymatous keratitis, glaucoma, especially secondary glaucoma, and in supra-orbital neuralgia. Abadie got good results with iodoform-lanoline in severe iritis and choroiditis. Pfalze, in 1889, recommended it in blepharitis. Von Mauthner adopted it in embolism of the central artery of the retina, and Hirschberg was the first to report a brilliant success. More recently Gradenigo recommended it in accommodative asthenopia, chronic tenonitis, and detachment of retina. But Hirschberg objects to its use in detachment, as temporary blindness has been observed after massage.

Up to this time effleurage alone, or in conjunction with an ointment or powder, had been employed. Maklakow, in 1893, first brought under notice vibration massage. For this purpose he employed Edison's electric pen, the pen point being armed with a small ivory ball; the vibration rate was 9,000 per minute. Concerning his experience with it Katsaurow writes: Intra-ocular tension was reduced even in glaucomatous eyes, favourable results got in swelling lens masses, keratitis parenchymatosa, and especially in episcleritis. Sneguirew reported favourable results in maculæ, keratitis parenchymatosa, follicular, granular and phlyctenular conjunctivitis, as also in hypopyon keratitis, iridocyclitis, traumatic cataract, and absolute glaucoma. Later he describes the influence of vibration massage on diffusion from the conjunctival sac towards the anterior chamber. He found by experiment with fluorescin that the rate of diffusion was increased, and that at the same time a diminution of intra-ocular tension was brought about. The heightened diffusion rate he explains by a quickening of the lymph circulation in the cornea and conjunctiva; while Von Adelheim has suggested the possibility of a lesion of the corneal epithelium, a view from which Golowine and Ewetzky dissent.

Piesbergen has used massage for nearly a year, employing an instrument which is used in England by photographers to retouch negatives. The vibrations are produced as in Edison's pen, but only amount to 200 per minute. The source of electricity is a Grenet or Bunsen cell, or small accumulator furnished with a rheostat. Application over the closed lid causes slight contraction with flow of tears, which soon ceases after repeated use. When applied to the sclera there is increase in the contents of the sub-conjunctival lymph vessels, then hyperæmia of the conjunctival and episcleral vessels. Intra-ocular pressure is reduced, and the retinal veins show distinct pulsation. He usually applies it to the eyelid, and by the finger-touch it can be observed that the whole contents of the orbit are affected by the vibrations. Beneficial results were obtained in rheumatic paralysis, secondary contracture, and scleritis.

Of the last, he says two obstinate cases of several years' duration were cured. The great injection after the massage disappears with the use of cold-water bandages. He continues the massage at longer or shorter intervals, until the injection ceases to appear after the massage, but in recent cases with corneal implication the method is contra-indicated. In one case of scleritis with sclerotising opacity, that of a woman of 65, after six months of the massage cure, or about fifty sittings, V. was raised from $\frac{6}{60}$ – $\frac{6}{38}$ to $\frac{6}{25}$—$\frac{6}{24}$. The opacity had considerably cleared up. In parenchymatous keratitis it should be used when the inflammatory symptoms are subsiding. Acute cases, as acute iritis, are not suitable, while chronic cases—iritis, irido-choroiditis, choroido-retinitis, often show brilliant results. General treatment is not to be neglected.

In three cases of syphilitic irido-choroiditis, after a preliminary mercurial treatment to get rid of acute symptoms, an improvment of vision was observed after every sitting. Still more striking was the success in chronic choroiditis and chorio-retinitis. In addition to the papilla becoming more sharply defined, subjectively there was also a diminution in the extent of the scotoma, an increase in extent of the field for colours, and a very considerable increase of the central vision. Eight patients were treated, of whom four were *old* syphilitic cases. In a woman of 44, affected for eight years, the V. improved from $\frac{6}{35}$ - $\frac{6}{25}$ to $\frac{6}{20}$—$\frac{6}{15}$. She is now able to read newspapers, which she had not done for the past four years. In two patients, one suffering for eighteen to twenty years, there was improvement from $\frac{1}{60}$ or $\frac{2}{60}$ to $\frac{6}{60}$. In a patient with extensive vitreous opacity, there was no improvement. In two cases of chronic choroiditis coming on five years ago after an obstinate attack of furuncles without diabetes, the improvement was striking. Two other cases are still under treatment, and show a decided improvement.

In central choroidal alterations with high myopia, vibration massage gave only slight results. Of five cases, two stated an improvement in vision, and there was also an apparent reduction in the myopia of about 3 D.

In very old macular hæmorrhage vibration massage may bring about improvement. A woman of 36, with myopia of 12 D., was under observation thirteen years. During pregnancy she had a right-sided macular hæmorrhage for which bleeding, purgatives and blue ointment proved useless. Eight years ago, when 41, during another pregnancy, she had a left-sided macular hæmorrhage. As a result, there was a scotoma in each eye. The massage cure had no effect on the right, but on the left V. increased from $\frac{6}{60}$ to $\frac{6}{20}$. Piesbergen has never treated embolism or thrombosis, but intends to use massage on the first opportunity. In a case of post-neuritic atrophy V. improved from $\frac{4}{60}$ to $\frac{6}{35}$, with enlargement of visual field, while in a case of simple atrophy no improvement followed. The author also records improvement in a case of relapsing sympathetic ophthalmia, and he was able to confirm the reduction of intra-ocular pressure in glaucoma. Before glaucoma operation the use of massage seemed to deepen the shallow anterior chamber, and in certain cases, where re-establishment of the chamber was delayed after operation, careful massage was beneficial. In discission for high myopia, swelling of the lens is hastened, tension reduced, and finally absorption strikingly accelerated. He begins it on the third day, and has never seen disturbance in consequence.

Piesberger thinks vibration massage promises good results in chronic inflammatory processes and their sequelæ. In all acute cases it is not to be employed, as symptoms of great irritation may be evoked. He excludes serous iritis and all acute choroidal affections from this treatment. As regards the method of employment of the massage, each case must be taken individually. The slighter the symptoms the more frequent and energetic the massage. In most cases, once or twice weekly, for three to five minutes, with slight interruptions during the sitting. Yet even in daily use, *e.g.*, in long-standing choroiditis, he has seen no evil consequences. In swelling of the lens he uses it thrice daily. Subjectively most patients experience improvement after weak and short sittings; after a long sitting patients do not see so well, but an improvement appears after some time.

He considers that improvement by vibration massage is an established fact in any chronic disease. It is difficult to explain how the improvement comes about. He conjectures that first there is a lymph stasis with an increased exudation of leucocytes, which according to Bernheimer's investigation play the most important part in the absorption of pathological products. From a physiological aspect the action of the vibration massage might be compared with the action of subconjunctival injections. He states that it is not easy to eliminate the psychic effects produced by the treatment. In cases in which there is any suspicion of such, he is wont only to appear to use the massage, the instrument not being brought into contact with the eye at all; any improvement due to psychic influence is thus eliminated.

VICTOR MILLER.

A. MAITLAND RAMSAY (Glasgow). Atlas of External Diseases of the Eye. *Glasgow: James Maclehose & Sons*, 1898.

This is a handsome volume, demy quarto, containing thirty full-page coloured plates, each of which presents from two to six separate illustrations, and eighteen full-page photogravures, together with nearly 200 pages of letterpress. Many of the illustrations, especially the photogravures, are excellent, and afford typical and striking illustrations of the conditions which they represent. Many of the coloured illustrations also have considerable artistic merit, but on the whole we are bound to say that the task which the author has attempted is an almost impossible one, namely, to give by means of pictures of the eye in various morbid states, information which shall be "useful to medical men in general practice who may not have many opportunities of visiting the wards and clinic of an ophthalmic institution." Precisely in those cases where a diagnosis is found difficult by the general practitioner, the morbid appearances upon which it must be based are such as cannot be reproduced with sufficient precision in a drawing. The tendency in all such pictures is to reproduce appearances which may happen to have been present in the case submitted to the artist, but which are adventitious rather than typical, and which, therefore, are absolutely misleading to an uninformed observer seeking to make a diagnosis with the help of a book. Thus we find a picture entitled acute choroiditis, which shows an eye with intense ciliary redness and something which looks like an opaque lens; another to represent sub-acute glaucoma, in which the lens looks as opaque as a swollen traumatic cataract; another to represent chronic glaucoma, in which the pupil is very widely dilated and the lens apparently opaque.

The object of the letter-press is not quite clear. It goes far beyond a mere description of the plates, but falls very far short of what it should be if it is intended as an outline description of the nature of the various diseases depicted. To begin a description of iritis with the statement, "In some cases inflammation of the iris is due to direct injury," is surely a bad way to give a beginner a true idea of the nature of that disorder; and a description of glaucoma, which covers more than twelve pages, and includes details of cases treated by the author, but makes no reference to the function of the angle of the anterior chamber, is distinctly out of date.

While we cannot commend the letter-press of this volume as a whole, or advise beginners to turn to it in place of one of the smaller modern handbooks of ophthalmology, we can give unqualified praise to many of the plates. They may certainly be used with advantage as a supplement to, though by no means as a substitute for, the clinical examination of actual cases.

PROF. HJORT (Christiania). On the Open Treatment of Wounds after Eye Operations. *Centralblatt für praktische Augenheilkunde, October*, 1898.

This article is supplementary to a previous one in the same journal for May, 1897,[1] in which Prof. Hjort advocated that no dressing whatever should be applied to the eye after operation unless in cases where pressure is specially indicated. Further, as a preliminary to operation, epilation of the cilia was advised as a measure specially tending to lessen the risks of wound infection during and after operation. The process is declared to be not very painful if done at several sittings on healthy lids. A list of 112 consecutive cases was quoted in support of the open treatment. Among the cases were included 52 of cataract extraction, 27 of these without iridectomy. In the earlier cases, 73 in number, an occlusion bandage was employed for twenty-four hours. In the last 39 cases, which included 18 extractions, no bandage or dressing of any sort was applied. After the operation the patient walked with assistance from the operating table to his bed in a very slightly darkened room. A 2 per cent. boracic solution was used to cleanse the eye during and subsequent to the operation. In no case did any infection of the wound occur, and the results are stated as highly satisfactory.

In the paper immediately under consideration Professor Hjort reasserts his continued faith in the method, and in reply to the objections of Czermak and Praun expresses his belief that even the wire shield which they employ to protect the eye is injurious, especially if it excludes free access of light and air. A subdued light he thinks most beneficial after extraction operations, preventing the photophobia which is apt to develop if the patient is kept in a dark room. Any occlusion bandage is contra-indicated from its interference with the "physiological toilette" of the eye, which depends upon the flow of tears and upon the movement of the lids in blinking. He quotes 118 extractions with one case of suppuration which occurred in a man with co-existing stricture of the tear duct, and whose conjunctival sac had been found on examination to contain pyogenic organisms. In another case the healed operation wound was burst on the eighth day by a blow from the corner of a shawl while a friend was examining the eye. The result was a prolapse of the iris which was excised, but this was followed by a long-continued iritis.

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[1] See OPHTHALMIC REVIEW, 1898, p. 81.

In the *Centralblatt* for March, 1898, Dr. Praun of Darmstadt had written objecting to Hjort's treatment as being too risky, while agreeing with him in the main as to the advantages of doing away with an occlusion bandage. He advocated the use of Fuchs's wire shield suitably padded as affording protection against injury, and at the same time retaining the advantages of the open treatment.

Professor Czermak, of Prague, in the May number writes saying that he has used no occlusion bandage since 1893, but only a wire shield, unless in cases where immobilisation of the part or pressure was specially indicated. He cites a list of 2,600 operation cases, including 700 extractions, and declares that the number of cases of wound infection is lessened by this method and the results are in every way satisfactory. He supports Praun's objections to Hjort's plan as too dangerous, and thinks the latter extremely lucky to have had so few mishaps with his patients, who must, Czermak declares, be extraordinarily quiet and reasonable in their behaviour.

When one thinks of the stress which ophthalmic surgeons generally lay on the use of the occlusion bandage over one or both eyes for three or four days at least after an operation such as extraction, the seemingly equally good results to be attained by entirely discarding the use of the bandage are striking; they suggest that perhaps after all it is not so necessary as one is apt to suppose, to cover up the eye except in order to protect from injury, and that the occlusion bandage is not a safeguard against wound infection, but rather the reverse.

J. V. PATERSON.

PANAS (Paris). Leçons de Clinique Ophtalmologique. *Paris*, 1899.

Should an ophthalmic surgeon ever by chance have the good fortune to have on his hands an odd half hour, there are many ways in which he might spend it with less benefit to himself and his patients than in dipping into this record of the clinical lectures of the great Parisian master of ophthalmology. These lectures have been prepared for the press by Dr. A. Castan, who in so doing has conferred a boon on his readers, who are sure to be many. One ought to understand the precise scope and intent of the book; it is not meant as a compendium of eye diseases, and does not profess to be such; it merely consists of careful notes, probably somewhat expanded, of clinical lectures given in the Hotel Dieu from time to time. It makes no pretence of being a text-book on diseases of the eye, but what it does do is to present a very lively picture of a number of the more frequent diseases, enlivened and made more useful to the listener or reader by the pithy descriptions, the clearly expressed comments, and the wise advice of one who with much experience unites sound judgment and skill. No subject is exhausted, but a case is taken which illustrates some form of disease or principle on which to work; the issue is clearly stated and briefly discussed. If we were asked to select those which seemed to us to be particularly good, we should say those on sarcoma of the orbit, on strabismus, on vitreous hæmorrhages, and on hydrophthalmos. Those papers which deal mostly with description of various operations and the rival merits of different plans of operating, are much less useful to read without illustration than they doubtless were to hear. With the limitations thus indicated the book is one which may be often turned to for a little advice, which is quite sure to be always thoroughly sensible.

HENRY COPPEZ (Brussels). Congenital Ptosis, along with associated movements of Upper Lid and Lower Jaw. *La Presse Médicale, Brussels, February* 12, 1899.

Another of those very singular and interesting cases has been recorded in which there was a close and involuntary association between movements of the upper lid and the lower jaw. In this case, when the patient, a young man, is at rest, there is distinct ptosis on the right side, but on his depressing the jaw or moving the chin to the left the lid at once rises, to such an extent indeed that the aperture is taller on the right side than it is on the left (healthy) side. Briefly, the condition is thus—the patient is unable to raise the right upper lid voluntarily, but when the lower jaw is moved the lid rises involuntarily, indeed even against his will. The explanation of the strange condition of the patient which Coppez favours is, that the nucleus of the levator palbebræ superioris is misplaced, and instead of being in relation with the nuclei of the third nerve, acts in association with, and is probably anatomically related to, the fifth nerve, along with the innervation of which it comes into action, in particular with that portion of the nucleus which presides over movements of mastication.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

H. R. Swanzy, F.R.C.S.I., President, in the Chair.

Thursday, March 9, 1899.

Implantation Cysts of the Iris.—Mr. Devereux Marshall recorded three cases of epithelial cysts of the iris which he had recently examined, and showed photographs in the lantern of the points of interest which each exhibited. (1) A boy, aged 12 years, whose eye was wounded eight years before. It remained quiet until three months before removal, since which time it had been painful and irritable. There was found to be a crescent-shaped scar of the cornea, to which the iris was adherent. At the bottom of the anterior chamber there was found a large cyst. On further examination the walls were found to be formed by the iris, which was split into two unequal parts; the iris itself was so atrophied that at one place the wall was composed solely of epithelium. (2) A man, aged 17, whose eye was wounded seven years ago with a piece of wood. It remained quiet until it received a severe blow two weeks before removal. A small cyst was then found at the upper and inner part of the anterior chamber. The anterior wall of this was composed of an extremely thin piece of atrophied iris lined with epithelium and adherent to Descemet's membrane. Its posterior wall was composed of the greater part of the thickness of the iris; the epithelium was laminated, and similar to that of the cornea. (3) A man, aged 29, whose eye was wounded some years before, and had recently become painful and quite blind. The eye was enucleated, and in the anterior chamber was found a small mass near the inner corneoscleral junction. It had developed in the muscular part of the iris. The cyst was found to be lined with epithelium, which had undergone great proliferation, so much so that its cavity was filled with degenerated epithelial cells which had become shed, and having no place of escape had become collected together in the interior of the cyst, thus giving rise to the dense white appearance noted during life. The epithelium in this case apparently arose from a portion of cutis which had become driven in at the time of the original accident, whereas in the other cases the epithelium of the cornea was almost certainly the cause of the cystic development. The question of cysts in general was shortly discussed, and some museum preparations of eyes illustrating the subject were shown.

Mr. Treacher Collins said these cysts varied greatly in situation; they were sometimes found in the substance of the cornea, sometimes in the anterior chamber after cataract extraction, sometimes in the iris itself, being occasionally caused by development of the root-sheath of an eyelash carried into the eye. They were also found in the vitreous, beneath the conjunctiva, and in the orbit. They might be classified as deeply pigmented and unpigmented, the former ones being due to a separation of the two uveal layers of the iris, the latter or unpigmented ones being either mesoblastic, due to dilated crypts of the iris, or due to epithelial inclusion after injury, in which cases their contents might be either clear or sebaceous, according to the source of the included epithelium.

Green Vision in a Case of Tabes Dorsalis.—Mr. Work Dodd related the case of an artist, aged 32 years. In 1886 his sight was quite good; in 1891 he had diplopia, from which he recovered. His colour vision remained good till 1897, and he complained of defective sight shortly before being seen in July, 1898. When first seen V. was R. $\frac{2}{60}$, L. $\frac{1}{60}$. He had Argyll-Robertson pupils, optic atrophy, and contraction of his visual fields, his gait was ataxic, and he had occasional trouble in passing water. In September, 1898, V. was reduced R. $\frac{1}{60}$, L. hand movements. He then saw everything a bright emerald green; it appeared to him as if there was a green veil hung before his eyes, through which he saw everything; he occasionally saw rose-pink spots through the green veil in places. The colours increased in intensity when he was tired, especially the rose-pink. He had also occasional sensations of very brilliant light.

Albuminuric Retinitis in a Child.—Mr. Arnold Lawson and Dr. Sutherland read a further note on a case. A girl, aged 12, was exhibited before the Society last year with advanced albuminuric retinitis in both eyes, and symptoms of chronic interstitial nephritis. Two weeks after she was shown to the Society she had uræmic convulsions and absolute blindness, which lasted some days. During the next few months she had headache and vomiting, but no more uræmia. In September she was re-admitted to the hospital for cardiac failure; death followed. The whole duration of the illness had been a year and three-quarters. *Post mortem* both kidneys were found granular; the heart was hypertrophied, and there was a cerebral hæmorrhage into both ventricles. In the retina exudation of the usual type was found at the central region. Congenital syphilis was suggested as a cause.

Mr. Holmes Spicer thought the suggestion of congenital syphilis as a cause was interesting. He had now under his care a female, aged about 20, who had interstitial keratitis in both eyes a few years ago, and other evidence of congenital syphilis. In the last few months she had developed very marked sclerosis of her retinal arteries, which presented the typical gold-wire appearance; she had retinal hæmorrhages, and flocculent masses of retinal exudation. Albuminuria was also present.

In reply, Mr. Lawson said that Dr. Guthrie, who had made the *post-mortem* examination, had found this condition present in children in many cases, and he believed it to be almost always due to congenital syphilis.

Strabismus Fixus.—Mr. E. Donaldson reported a case. A female, aged 46, had had convergent squint since childhood; the deviation was so great that the left cornea was almost hidden; under an anæsthetic the eye could not be drawn out, and it was impossible to reach the internal rectus to divide it. The other eye was also fixed in a strongly convergent position, but it was possible to divide the internal rectus; by separating Tenon's fascia freely from the globe the position of the eye was much improved. Snellen had published some cases, all of which were congenital; the condition had been named strabismus fixus by v. Grafe, but the cause was unknown.

Card Specimens.—Mr. Sydney Stephenson: A Case of Hippus.

Messrs. Brailey and Eyre: Case of Exophthalmic Goitre and Glaucoma.

Mr. R. W. Doyne: A peculiar form of Choroiditis occurring in several members of a family.

Mr. J. Griffith: Serous Cyst of Conjunctiva.

Messrs. Lang and A. H. Thompson: Two Cases of Embolism of Central Artery of the Retina, with escape of Papillo-Macular Triangle.

Mr. Reginald E. Bickerton: Haab's Magnet.

THE THEORY OF ACCOMMODATION.

BY M. TSCHERNING, PARIS.

AT the meeting of the Ophthalmological Society of the United Kingdom, on November 10, 1898, Mr. Priestley Smith showed several very ingenious experiments to aid in the study of the elasticity of the crystalline lens and the theory of accommodation. It appears from these experiments that it is not difficult to imagine a body having a form somewhat similar to that of the crystalline lens, and so constructed that in a state of equilibrium its anterior surface would present a conical form, and that this surface would be somewhat flattened when traction was made at the sides. Priestley Smith appeared to think that the elasticity of the lens was analogous to that of such a body, and he sought to show that the changes which I have demonstrated as occurring during the act of accommodation, namely, the temporary formation of an anterior lenticonus, were not incompatible with the theory of Helmholtz.

If Priestley Smith's views were correct, we should expect upon opening a dead eye to find the anterior surface of the lens presenting a conical form. But the contrary is the case. The curvature of the anterior surface is flattened in the middle and considerably increased towards the periphery.

Let me explain the manner in which I studied this question. I first place the eye to be examined in a small porcelain cup, having the same curvature as the posterior part of the sclerotic, and after removing the cornea and iris I put the eye, thus supported, under a mirror inclined at an angle of 45°, so as to be able to examine the anterior surface of the lens with the ophthalmometer of Javal and Schiötz. The images quickly lose their brilliancy by reason of the drying of the surface; but I obviate this difficulty with a drop of oil which spreads evenly over the surface, the excess flowing away along the groove between the edge of the lens and the sclerotic, where it is taken up with blotting paper. After a few experiments of this kind one is able to get images as regular and as true as those observed on the living cornea, and they remain good during a considerable time. If they become blurred before one has completed one's measurements, we have only to add another drop of oil. I begin by examining the lens by means of the keratoscopic disc of the ophthalmometer (after removal of the double-refracting prism). I place the instrument at first in such a way that the image is formed at the middle of the surface. Afterwards I displace the instrument so as to examine the images given by parts of the surface nearer and nearer the periphery. A divided arc permits me to measure the displacement of the instrument.

At the first glance one sees that the curvature of the surface increases considerably towards the periphery. Fig. 1 represents the images seen. They are deformed in the opposite way from those observed in the case of keratoconus (see my *Optique Physiologique*, p. 59). Now, there can be no question of any traction by the zonula under these circumstances. But if any doubt should remain in regard to this, we have only to remove the anterior part of the sclerotic and to divide the choroid at some distance from the crystalline, so that the lens, with its band of choroid, floats freely on the vitreous body. Under these circumstances also one observes the very same deformation of the images towards the periphery. It is not even necessary to cover the surface with oil to observe these phenomena

I have measured the radius of curvature of the surface every 5°, with an ophthalmometer containing a double refracting prism (doubling only 1mm.). I give here a few measurements of this kind :—

Observer	Age	Radius of curvature of the anterior surface of the lens, in millimetres							a	b	c	Refraction
		0°	5°	10°	15°	20°	22·5°	25°				
1. ERDMANN ..	16	13·9	13·1	11·7	9·8	..	..	..	6·37	2·93	0·789	E.
2. TSCHERNING	50	13·7	13·4	11·5	10·6	8	..	..	6·30	2·90	0·788	E.
3. HOLTH ..	28	12·4	12·0	11·0	9·0	7·0	..	..	5·82	2·75	0·777	E.
4. HOLTH ..	?	11	..	10·4	8·9	7·0	6·6	..	5·54	2·78	0·748	E.
5. TSCHERNING	41	14·1	..	13·3	10·2	8·6	..	7·4	6·68	3·15	0·777	M. 20
6. TSCHERNING	28	17·3	16·9	13·4	11·8	..	..	..	7·57	3·30	0·810	E.
7. BRUDZEWSKY		16·1	15·2	13·6	11·3	9·1	8·5	..	7·23	3·24	0·799	E.
8. Accommodated eye	27	5·6	5·9	7·0	18·0	79·2	..	..	1·53	2·92	4·64	

By comparing the figures given by the seven dead eyes thus examined with those of the eighth eye, which represents the eye in accommodation (see my *Optique Physiologique*, p. 163), one sees that there is no analogy between the accommodated eye and the dead eye. These figures enable us to determine what surface of the second degree most resembles the anterior surface of the dead lens ; it is in every case an ellipsoid of revolution about its small axis. The three columns, *a*, *b*, and *c*, indicate the demi-axis and the eccentricity of the surfaces thus calculated. Fig. 2 shows the form of the ellipsoid of eye No. 7. Fig. 3 represents the crystalline lens accommodated.[1]

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[1] Eyes Nos. 6 and 7 belonged to the same person. The last column shows the refraction of the eye ; it was not determined before death, but

The hypothesis of Helmholtz still finds defenders, especially in Germany, and the ophthalmological world seems to find it difficult to admit that so great a physicist could have been mistaken. I may therefore be allowed to say a few words from an historical standpoint, which show that the fault is not wholly his.

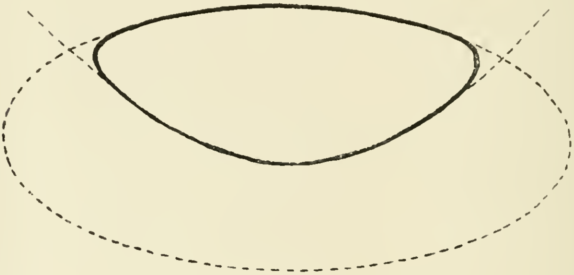

FIG. 2.

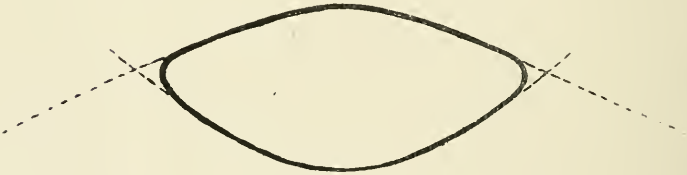

FIG. 3.

It appears from the words of Helmholtz himself that he conceived his theory while comparing the measurements obtained in examining living eyes with those obtained in examining dead ones. In measuring living eyes he had found with his ophthalmometer the following figures for the radius of curvature of the anterior surface of the lens.

At rest	11·9 mm.	8·8 mm.	10·4 mm.
In accommodation...	8·6 mm.	5·9 mm.	

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was judged approximately by the form of the eye; it is of little interest except in the case of eye No. 5, which had a well-marked posterior staphyloma, the length of its antero-posterior axis being about 30 mm.

figures against which no objection can be made. As to dead eyes the measurements which Jean Louis Petit had made in the first half of the eighteenth century were, when Helmholtz wrote, admitted by every one. I subjoin a table giving the values of Petit for the radius of curvature of the anterior surface of the lens in millimetres.[1]

Age	Radius of Curvature	Age	Radius of Curvature
	mm.		mm.
12	8·5	45	7·3
15	6·8	45	7·3
15	6·2	50	7·9
20	6·8	50	7·9
25	6·8	55	7·3
30	6·8	55	12·4
	8·5	60	9·0
30	6·8	60	9·0
30	8·2	60	9·0
35	10·2	60	8·5
40	6·8	60	13·5
	8·5	60	11·3
40	6·8	65	10·7

It is plain that the comparison between these figures and those obtained in examining the living eye lead directly to the hypothesis of Helmholtz. In the case of old people the figures correspond closely with those found in the living in a state of rest, while in the case of young people the radius comes nearer and nearer to that found in the accommodated eye. The evidence becomes still more convincing if we take the average for different ages (while excluding the first eye for obvious reasons).

Age ...	15 to 30	30 to 40	40 to 50	50 to 60	60 to 70
Radius of curvature...	6·4 mm.	8·1 mm.	7·3 mm.	8·9 mm.	10·1 mm.

We may now be astonished that so conscientious an observer as Petit should come to conclusions so little justified by the facts, but our astonishment becomes less perhaps when we learn how Petit made his measurements. He placed the eyes to be examined very much as I have placed them ; but his measuring apparatus consisted simply of brass plates cut according to the arcs of circles of different radii. He sought among these the arc which adapted itself best to the surface he wished to measure. It is hardly a matter of surprise that with such apparatus he should have made fairly accurate measurements of the lenses of old people which are easily handled because of their greater hardness, and that his method was wholly insufficient in the case of the softer lenses of young people. It is also to be remembered that in Petit's days the theory of presbyopia would lead one to expect to find the difference which he observed between the lenses of old and young people. Is it not curious that we are still suffering the consequences of these faulty measurements made almost two hundred years ago ?

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[1] I am indebted for part of the historical details which follow to a very valuable work of Dr. A. Stadfeldt: *Om den menneskelige Linses Optiske Konstanter*, Coenhagen, 1898.

Helmholtz had himself measured two dead lenses (radii 10·2 mm. and 8·9 mm.), with his ophthalmometer. He says that the measurements corresponded closely with those found in living eyes in a state of rest, but naturally he was not much influenced by an observation made on so small a number of lenses, especially as he was perhaps ignorant of the ages of the individuals from whom they came.

But when Helmholtz was making his researches, a series of measurements had been taken by C. Krause, which, considering the manner in which they were obtained, are wonderfully correct, but which seem at that day to have inspired much less confidence than was given to the celebrated measurements of Petit. Krause cut the eye in two according to its axis, placed one half in water under a micrometer and made his observations with a microscope of low magnifying power. Krause observed that the surface of the lens was nearly that of an ellipsoid of revolution about its smaller axis. The following table gives his values for the two demi-axes and for the radius of curvature of the summit.

Age	21	21	29	29	30	40	40	50	60
Radius at the summit ...	9·6	9·8	8·8	11·2	10·0	7·9	8·6	5·6	9·9
A	4·5	4·6	4·4	4·6	4·6	4·5	4·6	4·6	4·5
B	2·1	2·1	2·2	1·9	2·1	2·6	2·5	3·8	2·1

Here all analogy with the accommodated eye has disappeared and the radius of curvature, although still a little too small, comes near to the values I have found.

Let me add that Chossat had already shown in 1819 that the anterior surface of the lens of the ox increased in curvature towards the periphery. This was verified later by Moennich and by Crzellitzer.

There exists then no analogy between the dead lens examined *in situ* and the living lens in a state of accommodation. But I have shown that by lateral traction made upon the zonula we can change the form of the dead lens in such a way that it becomes analogous to that of the lens in accommodation. These experiments have been verified and completed later by the researches of Crzellitzer in the Heidelberg laboratory.

It may be added also that in examining dead eyes as we have done, we may produce changes which up to a certain point resemble those of accommodation. An experiment of this kind was devised by Dr. Druault. By means of a Pravaz syringe we injected more or less liquid into the vitreous body while the images were being observed with the ophthalmometer. The curvature increased regularly with each injection, and again diminished when the liquid was withdrawn. Under the influence of increased tension the lens in fact is displaced a little upwards, thus causing a certain degree of traction on the zonula with the result of increasing curvature. This increase of curvature can be pushed to a high degree, but the change produced in this way is not altogether analogous to that which takes place during accommodation. We observe indeed the increase of curvature at the middle of the surface but not the flattening towards the periphery, where the curvature still increases.

Fig. 4 shows the images of the first eye we have examined (Erdmann). Fig. 5 shows the images of the other eye of the same person—drawn with the same magnification—after injections had been made in the vitreous body. (Radius at the summit in the first case 13·9 mm., in the last 8·2 mm.).

The difference between the change obtained in this manner and that which accompanies the accommodation is explained by the directions of the traction made upon the zonula. In our experiment the traction is made from behind in a direction almost parallel to the visual line. During accommodation, on the contrary, the traction is made outwards and a little backwards. Heine (Marburg) has obtained an analogous result by simply compressing the globe.

EXPLANATION OF DIAGRAMS.

Fig. 1. Keratoscopic figures of the anterior surface of the lens (eye No. 7), drawn (with the others), by M. Brudzewsky, *A* at the middle of the surface, *B* and *C* at about 20° from the axis.

Fig. 2 (on p. 94). The dead lens.

Fig. 3 (on p. 94). The accommodated lens. The dotted curves indicate the form of the surfaces of the second degree to which the surfaces of the lens most nearly approach.

Fig. 4. Keratoscopic figures of the anterior surface of the lens (eye No. 1). The images are less regular than those of fig. 1, because the preparation was less well made, it being the first eye we examined. A at the centre; B at 17° from the axis; C at 13° from the axis.

Fig. 5. Figures of the fellow eye of that which gave us Fig. 4, after injection of the liquid into the vitreous. A at the centre; B and C at about 30° from the axis.

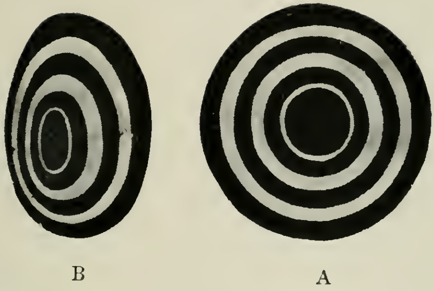

FIG. 1.

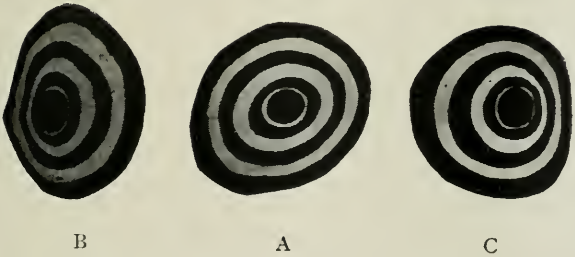

FIG. 4.

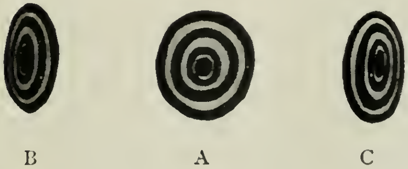

FIG. 5.

SARADETH (Ruhpolding). A Case of Puerperal Metastatic Panophthalmitis. *Münchener Medicinische Wochenschrift, No. xi.*, 1899.

Cases are fortunately not very frequent in which the occurrence takes place of panophthalmitis following upon confinement: it is worth while, therefore, to refer to this, observed by Saradeth. The patient was a primipara, aged 34, of somewhat delicate constitution, whom the author saw twelve days after a somewhat prolonged labour. She had advanced by that time so far, however, as to have been out of bed, but abdominal pains obliged her to seek advice. He considered that involution was imperfect, and ordered ergotin, but could find no cause for the slight increase of temperature, which stood at 39·1° C. (102·4° F.) Under treatment this went down, but severe hæmorrhage occurred, and after free washing out, a fragment of placenta, the size of a plum, came away, although the midwife who had attended the patient had been quite sure that none had remained after delivery. For some time after this the temperature varied greatly, though always keeping high, on one or two occasions being over 40° C. (105·4° F.), with rigors and other symptoms. On the twenty-first day after delivery she first complained of pain in the right eye, which was watering a little. This continued for some days, while the eye became injected, the pupil reaction less free, and there was some swelling and pain all over the right side of the face. By the fortieth day after delivery the temperature had been normal for some time, there was great improvement in the general condition of the patient, the great swelling of the lids and the proptosis had passed away, but the eye was blind, the cornea was dull and insensitive, and there was a deposit of thick masses of pus in the anterior chamber. Three or four days later the pus got exit at the outer canthus. It is unnecessary to refer to the literature of this subject further than to say that the prognosis as regards life in such cases is distinctly bad, even in those in which the panophthalmitis is unilateral; where that is bilateral the prospects are even worse. Axenfeld collected from various sources notes of 105 cases, 75 of which proved fatal.

McKEOWN (Belfast). A Treatise on Unripe Cataract. *H. K. Lewis*, 1898.

In this book the author gives a full description of his method of operating on immature cataract with the aid of irrigation by sterilised salt solution. There are two independent procedures: (*a*) The injection of fluid inside the capsule of the lens by means of a fine hollow needle, with the view of breaking up the cortex and of separating it from the capsule. This is not always done; it cannot, in fact, be accomplished when the cortex is sclerosed; and the impression given by reading the cases is that its advantages are less apparent than its risk, although dislocation of the lens never actually occurred in the author's hands. (*b*) Irrigation after capsulotomy and expulsion of the lens. This is done in the following ways, placed in order of their efficiency: (1) by depressing the sclerotic lip of the wound with the injection nozzle; (2) by introducing the nozzle inside the wound; (3) by introducing the nozzle well into the anterior chamber; (4) by introducing the nozzle into the capsule and behind the remnants of cortex. The regulation of the temperature, force, and flow of the injected fluid is obviously a somewhat delicate matter, and it may be noted that the author considers it essential that there should be a specially trained assistant whose sole duty it is to look after the irrigation apparatus.

Details are given of all the cases in which the author has employed the method, 155 in number. There were no operative accidents which could be fairly attributed to the irrigation. Rupture of the suspensory ligament and prolapse of vitreous were remarkable by their absence, probably owing to the fact that the suspensory ligament is still strong when the cataract is unripe. With regard to the development of secondary cataract, which it was thought would be a frequent result of removing a lens whose cortex still showed signs of vitality, it is evident that this objection has no basis in fact, for the percentage of secondary operations required was small. It is difficult to judge from the description of the cataract before operation, which is often confined to the statement that it was "striated," "flaky," &c., without note of the degree of vision present, whether it might not have been possible in a considerable number of these cases to extract the lens successfully without irrigation ; but assuming that the majority of them were of such a character as, if treated in the ordinary course, would have given the surgeon reason to regret his temerity, we may say that the author fairly establishes his contention that unripe cataracts may be operated on by this method, with results as good as those obtained when maturity is waited for.

The suggestion that this method might enable us to deal more efficiently with some forms of traumatic cataract, particularly cases in which suppuration is to be feared, seems a good one, but the author does not bring forward any cases in which he has carried it out.

WALTER H. H. JESSOP. Ophthalmic Surgery and Medicine. *London: J. and A. Churchill*, 1898.

In his preface Mr. Jessop says that his endeavour in writing this manual has been to make it systematic, practical, concise, and at the same time comprehensive ; and it must be admitted that in this endeavour he has thoroughly succeeded. It is not easy, in these days when the subject of ophthalmology has become so large, to compile a work which is at once comprehensive and suitable to students—to whom Mr. Jessop dedicates his little book; it is difficult to avoid being either too discursive or too dogmatic. For the purpose in hand, it is probably better to err in the latter than in the former direction—to give one's readers an emphatic statement of the principles upon which the author guides his own conduct, and by whose light he acts, and leave to a later and more mature period the discussion of doubtful points. Some of Mr. Jessop's chapters are very good indeed, notably that upon the Pupil, as indeed was to be expected from one who has devoted so much attention to the questions of pupillary action; we should call this the best section in the whole book. Some other chapters are decidedly weaker, especially that on Orbital Diseases, which is, perhaps, the least satisfactory of all. The last section, upon Eye Symptoms in Various General Diseases, is very useful for reference, and with a little expansion would be very valuable indeed. There are appendices giving a number of convenient formulæ for applications to the eye, regulations relating to the testing of candidates for the various public services, hints as to operations, &c., which are all very serviceable. All through the book, we are sorry to notice occasional lapses into carelessness of composition which mar the general good effect. The illustrations are fairly numerous, but are sometimes what one might call traditional. What is the use, for example, of fig. 92, which is simply a pair of straight, blunt-pointed scissors? In place of such diagrams as these there should rather have been representations of the diplopia produced by paralysis of various muscles, more especially as the written description of this matter is somewhat meagre. There is a good and copious index; the letterpress and general "get up" of the book are all that could be desired: it is good to see so beautiful a casket provided for Mr. Jessop's jewels. The book ought to take, and will take, an honourable place among manuals of ophthalmology.

ZIRM (OLMUTZ). Treatment of Hypopyon Keratitis. *Wiener Klinische Wochenschrift*, 9, 1899.

Sæmisch's operation of division of the ulcer right across its base is no doubt a method of treatment productive of very great immediate good, yet the author of this paper brings against it the accusation that very rarely if ever does he obtain healing up of the wound without incarceration of the pupil margin in the wound, a condition on account of which he has not infrequently been obliged to perform iridectomy or even enucleation in eyes which were supposed to be saved from destruction, but which, as a distinct consequence of the treatment then employed, fell victims to secondary glaucoma. In place of division of the base of the ulcer with a Graefe knife, therefore, he then preferred to perform paracentesis at the lower periphery of the cornea with a keratome; inclusion of the iris thus became a much rarer misfortune, and his cases of secondary glaucoma less frequent. The occurrence several times of a minute perforation of the floor of the ulcer when using the cautery showed him that the pus could escape through a very small aperture, and that even a partial removal was usually followed by rapid absorption of the remainder. He has come to the conclusion, too, that it is unwise, especially in those cases in which there is rather free discharge, to use any occlusion bandage, an opinion in which both on theoretical and on practical grounds we heartily concur. Zirm has also discarded the employment of lotions, and uses instead sublimate-vaselin, which he never finds to cause irritation. Iodoform had with him given place to airol, but as that, though an excellent and thoroughly reliable antiseptic, gave rise sometimes to severe irritation, he now employs xeroform, which presents the same advantages, while it is without the disadvantages. A similar sequence of applications has taken place in the treatment of the sac lesions so frequently present in cases of hypopyon keratitis, for whereas he used to wash out the lacrymal sac with airol, he now employs for this purpose an emulsion of xeroform. At the same time he has great faith in the frequent and thorough squeezing out of the contents of the sac, which must be emptied completely eight or ten times a day. In the efficiency of the cautery he places much reliance, but though he has tried sub-conjunctival injections, the procedure is so painful that he has discontinued their use. His routine, then, is as follows:—First, the cautery in all cases, but tapping of the anterior chamber only in the presence of a large quantity of pus; atropine or scopolamine instilled two to four times a day; the eye shielded but not closely bandaged; every hour or two hours, day and night, the shield is removed and sublimate-vaseline 1 in 5,000 introduced between the lids and gently rubbed over the eye; xeroform powder freely dusted into the eye from three to six times a day; if blennorrhœa of the sac is present, pus is thoroughly squeezed out of the sac frequently in the course of the day, and the sac washed out with xeroform emulsion (xeroform 10, glycerine and distilled water each 50 parts) two to four times a day; if the ulcer should advance, the cautery is re-applied. Every surgeon of experience has his own routine method of treating this too common disease, and places his chief reliance upon some application or procedure, but it is well to compare notes and perhaps gather something from the study of another's system. The truth is that most cases will do well on any plan which involves the clearing away of diseased and effete products, and keeping the ulcer thoroughly clean, though the methods of attaining this end may be varied. No one antiseptic is a specific in this condition.

HUGO WEISS (Vienna). A Case of Tumour of the Corpora Quadrigemina. *Wiener Klinische Wochenschrift, March* 2, 1899.

At a recent meeting of the Wiener Medicinischer Club, Weiss exhibited a patient in whom he had diagnosed tumour of the corpora quadrigemina, and as the ocular symptoms were of some interest, we reproduce part of the record.

The case was that of a woman, aged 61, with no hereditary taint, who had been in good health up to May, 1898, and had only suffered from occasional headaches; latterly these had begun to increase in severity, but up to the date mentioned there had been no vomiting. On May 20, however, she had a bad attack of giddiness followed by emesis, and for four weeks this condition persisted; at the same time tinnitus of the left and severe stabbing pain in the right ear and temple were complained of. In July hearing became worse and worse until in the *left* ear there was complete deafness, and about the same time ptosis and outward deviation of the *right* eye appeared. Headache, vomiting and giddiness, however, became less frequent until they may be said to have ceased except on sudden movement or emotional excitement; the patient suffered from bronchitis and joint pains. The patient was neither a drinker nor had had syphilis; she had had two normal pregnancies and no miscarriages. Besides unimportant troubles the nervous system presented the following lesions: On the right side complete ptosis, great deviation outwards, the eye could not be moved inwards, upwards or downwards; the pupil larger than that of the left eye, immobile to light, scarcely moving on accommodation or convergence; V. = counting fingers at ½m. The left eye was normal, and in the fundus of neither was there anything pathological The state of hearing has been indicated above in general terms; the other cranial nerves were intact, common sensation in the face normal, as well as facial movements and deglutition. Motion and sensation in limbs were normal. There was no distinct ataxia, but fine intention-tremor in the upper extremities; reflexes exaggerated. The diagnosis lay between cerebral syphilis, tumour of the cerebellum, and tumour of the corpora quadrigemina. Syphilis seemed excluded by the history and by the absence of remissions, while the want of ataxia, the isolated ophthalmoplegia and the deafness tell against a cerebellar site. The author might have added to these the absence of optic neuritis. On the other hand, the complete paralysis of the right eye, the loss of vision, the tremor, and the crossed deafness are all in favour of a tumour of the right anterior corpus quadrigeminum, injuring also the bundle of (crossing) auditory fibres, and finally involving the right posterior corpus. Such cases are well worthy of careful record.

F. TERRIEN (Paris). Thérapeutic Oculaire. *Paris: Baillière et Fils.* 1899.

This little book of ninety-six pages is not a treatise upon the therapeutics of diseases of the eye, as one might be apt to suppose, but deals only with a few of the more recent methods of treatment—in fact, it is a sort of Year-book of Treatment of the eye, though it is not an annual publication. The matter in it is therefore not original, but is only a brief account of various new methods of treatment, such as the employment of oily collyria, protargol, ablation of the lacrymal gland, and extraction of the lens for myopia. Most of the information is simply copied from articles in medical journals dealing with those subjects, and though it purports to concern itself only with new matter, some of the contents do not strictly answer to that description; nor is the whole of the ground indicated covered by the writer. Indeed, it is not easy to see why the author felt himself called upon to compile a book which is neither sufficiently complete to be really valuable, nor recent enough in some parts to justify its want of completeness. We should not judge that there could be much demand for it.

VALUDE (Paris). Reclination of Cataract in a Patient whose other Eye had been lost by Hæmorrhage. *Annales d'Oculistique*, *January*, 1899.

It is but seldom that an ophthalmic surgeon nowadays has any occasion to resort to a mode of operation so out of date as reclination, which has practically ceased to be a recognised mode of procedure. Valude, however, has found it of great advantage in a case of which he gives an interesting account. He operated for cataract in the ordinary way on Mme. C., a patient of 73, who showed no abnormality of vascular system, who was not unduly nervous, and whose eyes, except for the presence of cataract, were apparently quite normal. Tension was normal, perception and projection good, and the iris mobile. The operation, under cocaine, without iridectomy, went off smoothly, and nothing untoward occurred until immediately before the application of the dressing, when, without any warning, without any straining, speaking, or movement on the part of the patient, and without any pain, a hæmorrhage took place from the deeper parts of the eye, completely destroying it. This destructive accident having occurred in one eye quite unprovoked, it was manifest that a similar operation was contra-indicated in the case of the other, in which there was a ripe cataract; what then was the best course to adopt? The patient, unlike so many who have experienced a misfortune at the hands of a surgeon, was desirous that he should at once undertake the removal of the second cataract. To repeat the ordinary extraction in the other eye would probably be to repeat the same accident; to break up the lens with a needle and extract by linear incision, would, in a patient so advanced in life, be, in Valude's opinion, simply to court disaster, though there are some surgeons who have recommended it; to perform reclination seemed the only alternative, though an unattractive one. The operation of depression or reclination is, as every one knows, liable to be followed by evil results of several kinds, but how many of these may be avoided by careful antiseptic precautions is not certain. At all events, the risks had to be run, there was no other way. Valude resolved to operate through the sclerotic—the method most in repute before the era of extraction—but having noted in the first eye that there had been large soft masses of cortex, he feared to use a sharp needle, lest he should accidentally rupture the capsule in the act of depressing He therefore adopted the following procedure, recommended by Gensoul of Lyons, and modified by Desmarres, but originally derived from the Arabic and Egyptian physicians of olden times. He made a small incision in the sclerotic a few mms. outside the limbus, with a fine knife, and then introduced, by the aperture thus made, a small curette, with which he depressed the lens without risk of rupturing the capsule. The operation was easy and painless, the lens was held down in its new position for a few seconds with the instrument, and on withdrawal of the curette it showed no tendency to leave its resting place. The pupil looked quite black. After operation there never was a trace of pain, nor was there any vomiting, such as some of the older surgeons used to describe. The patient left hospital in about eight days, having V. with + 12 D. = $\frac{1}{3}$, with + 15 D. she could read the newspaper; the pupil was black, there was slight tremulousness of the iris. With the ophthalmoscope could be seen a distinct cupping of the disc which was somewhat pallid, and some tortuosity of the vessels. This condition of a chronic simple glaucoma without elevation of tension, may very probably have been the cause of the inopportune hæmorrhage in the other eye. Valude saw the patient again six weeks after the operation, when the eye was still well and quiet. Although one swallow does not make a summer, still Valude's success encourages one to hope that in a case such as his, where for some reason extraction cannot be done, our resources are not exhausted, and reclination may give a good result which we may trust will be permanent. The recital of this eminently satisfactory case may serve to cheer a surgeon greatly when face to face with a very depressing state of affairs, and to encourage the adoption of a bold but wise endeavour.

TRANSACTIONS OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY: Part II., 1898.

Purulent Ophthalmia in Infancy. — The report of the majority of the special committee was read. The report advises legislation on the subject of compulsory prophylactic measures in almshouses and State institutions, recommending the routine use of silver nitrate solution with all newly-born children, or some other equally safe and efficient method.

A minority report followed, which "expresses disapproval with compulsory legislation, asserts that there are no sufficient data regarding the frequency of blindness caused by ophthalmia neonatorum in the States, and that the statistics of other countries, especially Germany, are of doubtful value or positively misleading. In the opinion of the minority the Society would do most to prevent blindness from ophthalmia neonatorum by the accumulation and dissemination of exact knowledge regarding it."

The Society ultimately adopted the following resolutions:—

Whereas purulent ophthalmia of infancy produces more blindness than any other disease, thus necessitating great and often unnecessary cost to the State, with lifelong misery to the individual; and

Whereas a 2 per cent. solution of $AgNO_3$ dropped into the eyes of children as soon as possible after birth is one of the most efficient means of preventing that disease; therefore

Resolved.—That we desire to call the attention of obstetricians to the fact that these cases are unfortunately common in our practice, and to urge the more frequent use of the silver nitrate solution in the manner described by Credé.

Resolved.—That we approve of legislation which would result in the invariable use of this method in almshouses, or any other equally safe and efficient, whereby the loss of vision from this disease would be lessened.

A very interesting series of unusual tumours of the "orbit, eyelids and vicinity" was narrated by Dr. Bull:—

(1) Was a boy, aged 6, who presented a tumour in the subcutaneous cellular tissue just below the lower lid on the right side, about the size of a small filbert. The skin was of normal appearance and freely movable over the

tumour. The latter was smooth, non-lobulated, painless and elastic, and resembled a fatty tumour, which was the diagnosis made. It had been noticed about three months. It was removed without any difficulty, shelling out like a pea from a pod. It proved to be a *cysticercus cyst.*

(2) *Fibro-lipoma of the accessory lacrymal gland.* — This occurred in a boy, aged 6, and had been noticed eighteen months as a small lump in the region of the lacrymal gland about the size of a lima bean. It was accompanied by another small growth on the corneal margin resembling an ordinary dermoid, which was the diagnosis made for both tumours. The larger tumour, however, proved to be a fibro-lipoma connected with the accessory lacrymal gland.

(3) Another interesting case was one of *tubercle of the eyeball simulating glioma*, in which the eye was converted into a breaking down tuberculous mass. A yellowish reflex from the fundus suggested the diagnosis of glioma; but the marasmic condition of the child, who was 3 years of age, together with a family history of tubercle or chronic pulmonary disease, suggested the possibility of tubercle.

(4) The last case was one of myxo-sarcoma of the orbit occurring in a child, aged 3, and making its appearance about three months after a severe blow to the eye. As almost invariably happens in malignant disease of childhood, the disease ran a rapidly fatal course, recurring two months after exenteration of the orbital contents.

Dr. Fridenberg reported a case of exostosis of the frontal sinus which was successfully removed by chiselling away the anterior wall of the sinus, showing the tumour attached to the posterior wall, whence it was detached by twisting it away with bone forceps. Very little difficulty was experienced. The operation was performed in January, 1894, and there had been no recurrence. Two photographs, "before" and "after" the operation, are given. The contrast between the two is remarkable, and well exhibit the flattering effects of a clean shave and wash, hair nicely parted, trimmed moustache, clean collar and the latest thing in ties upon a surgeon's handiwork. The tumour was composed of a dense, ivory-like shell enclosing a mass of cancellous tissue with a central cavity.

Dr. Hermann Knapp recounted two cases of acute glaucoma supervening upon needling for membranous cataract. In each case the capsule was crowded into one spot, causing bulging of the iris and thus blocking the corneo-iridic angle. Apparently both were cases of extraction without iridectomy.

Dr. Walter B. Johnson gave an account of three cases of buphthalmos occurring in the same family. The history of the cases shed no light upon the causation. Two of the children had operations performed elsewhere, and in one child a certain amount of sight was kept in one eye. Dr. Johnson performed double iridectomy in the third case with satisfactory results, in that progression of the ocular growth ceased and some vision was retained. The presence of extensive choroido-retinal changes, which were observed in one child, would seem to indicate that the disease was probably of specific origin.

Dr. de Schweinitz contributed two cases of metastatic carcinoma of the choroid, both of which, as is most commonly the case, occurred secondarily to mammary carcinoma. One patient died from intracranial deposits a few weeks after removal of the eye. In the second case also recurrency of the disease had made its appearance elsewhere.

The same author narrated two more interesting tumours. The first described was an *angioma or cavernous nævus of the upper lid* over the region of the lacrymal gland, and extending back to the apex of the orbit. The tumour was dissected out, the skin being quite free and easily separated. An interesting feature was the absence of severe bleeding that attended the operation. The tumour was enclosed in a delicate sheath of connective tissue, and microscopical examination proved it to be intimately connected with the gland, and in parts invading and replacing the glandular structure. The involvement of the gland must be considered to be probably secondary to an origin in the orbital tissue. No damage was done to any muscles of the eye by the operation, with the exception of the lev. palp. sup. which was itself involved in the growth.

The second was still more interesting, being a *primary epithelial tumour of the caruncle*, its microscopical characters exhibiting columns of spheroidal epithelial cells with numerous "bird's-nest" bodies such as are so frequently seen in squamous epithelioma. As the caruncle may be regarded as a portion of modified skin, we may expect to find all such tumours as are met with in the skin elsewhere, and this is indeed the case, though every kind is rare. Adenomata, dermoids, sarcomata and epitheliomata have all been occasionally described. In this case the exact series in which the tumour should be placed is uncertain, and some might regard it as an adenoma. The tumour is described as a carcinoma, but it had existed for about twenty years before removal, though it had begun to grow before operation. The author justly remarks that these small epithelial tumours frequently run a benign and almost stationary course, but must always be viewed with suspicion as liable to assume the characters of malignancy at any time.

Lymphomata of the Lids.—Dr. Myles Standish. A fair number of cases have now been put on record showing the value of the internal administration of arsenic in tumours of a lymphatic nature. In some of these cases the tumour has absolutely disappeared, whilst in others they have very materially diminished in size. Dr. Standish brought forward two cases of lymphatic tumour of the lids, one of which, occurring in a man of 66, was successfully removed, without any recurrence two years later, the growth being histologically a lymphosarcoma. The second case was that of a woman, aged 63 years, who reported slowly increasing swellings at the site of each lacrymal sac for six years and similar hard swellings in both lower lids and one upper lid for about one year. Several operations were undertaken for the removal of these tumours, but in each case recurrence of the growth speedily occurred. Microscopically the lymphatic nature of the tumour was apparent, though the differential diagnosis between lymphoma and lymphosarcoma was doubtful. Examination of the pharynx revealed several closely aggregated growths with the general aspect of adenoid tissue, and which became gradually so numerous and so large as to cause such serious obstruction to respiration that the patient could not sleep, except in a sitting position. It was at this juncture that arsenic was tried; 5 drops of liq. pot. arsen. was ordered thrice daily, gradually increased to a maximum of 10 drops three times daily with occasional cessation of the drug when such action appeared necessary. The tumour continued to increase for a month, but at the end of this time improvement began to be noticed. Twenty days later the diminution was noted as nearly one-half. The tumours gradually disappeared altogether whilst the pharynx cleared up in the same remarkable way. The patient was last seen about six months after the first administration of arsenic. She had then taken no arsenic for three months and there was not the slightest trace of any return of the disease.

Delayed Union after Cataract Extraction formed the subject of a paper by Dr. George Harlan. The author first related two cases of his own, in one of which the wound remained open for at least ten days, and then healed with the base of the iris adherent throughout to the corneal cicatrix, causing slight displacement of the pupil upwards. No iridectomy had been performed, and though the author does not say so, it would appear from his notes that it was the intervention of the iris between the lips of the wound without any actual prolapse which delayed the union. In his second case the wound remained open for three weeks and then firmly united (with V. = $\frac{6}{9}$) after a gentle application of the mitigated nitrate stick to the edges of the wound. No cause for delayed union could be found, and a preliminary iridectomy had been performed. After reviewing the literature on the subject, Dr. Harlan summarised the various causes of delayed union thus:—

(1) An irregular or ragged incision.

(2) The presence of fragments of capsule, lens, *débris*, or vitreous shreds in the wound.

(3) Hernia of the iris.

(4) Adhesion of the iris to the posterior lip of the wound.

(5) Pinching of the conjunctiva or iris in the angles of the wound.

(6) Entropion occasioned or increased by the dressing.

(7) Disturbance of the wound by too frequent examinations and dressings.

(8) Failure of reparative power due to something in the condition of the patient.

(9) Excessive secretion of the aqueous humour.

As regards treatment the author was of opinion that the compress and atropine should be given at least a month's trial. Any prolapse of the iris should be removed. Lens *débris* or capsule may be removed with a spatula. Iridectomy, although there had been no prolapse, has been promptly successful in a number of cases. Cicatrisation has followed the stimulation of the wound by silver nitrate, iodine solution, or the galvanic cautery in three instances. Should entropion be present the surgeon must decide between relieving the condition by operation and removing the bandage.

Dr. Holden contributed an important paper upon the *Pathology of Quinine Blindness.* De Schweinitz and others had previously shown that quinine blindness depends upon an ischæmia of the retinal and optic nerve vessels caused by their contraction under the influence of highly cinchonised blood. This is followed by atrophy of the optic nerve extending backwards throughout the chiasm and tracts. Dr. Holden, by a series of experiments on dogs, filled up in this paper the gap in the pathological processes between the primary construction in the vessels, and the commencement of the optic atrophy. Briefly, he found that the process in quinine amblyopia is one of degeneration of the nerve fibre and ganglion cell layers of the retina, due apparently to insufficient nourishment because of the constriction of the retinal arteries. This degeneration is followed by an ascending atrophy of the nerve and tract which extends up to the external geniculate body and the pulvinar. The other layers of the retina apparently do not suffer. Clinically it is found that amblyopia does not occur unless the injection of the quinine should produce marked constriction of the retinal arteries. The retinal changes are analogous to the degenerative changes which follow so-called retinitis of the inner layers, which are supplied by the retinal vessels, in contra-distinction to the two outer layers which are supplied by the choroidal vessels.

ARNOLD LAWSON.

OPHTHALMOLOGICAL SOCIETY OF PARIS.

JANUARY 3, 1899.

Recueil d'Ophtalmologie, January, 1899.

M. WUILLOMENET briefly reviewed the work of the Society in the past year. M. Jocqs said a few words on retiring from the office of President, and M. Boucheron delivered a short address on succeeding to the chair.

The following papers were then read :—

M. A. TERSON. *Two Cases of Parenchymatous Keratitis in Acquired Syphilis* (with the exhibition of the patients).

The first case was that of a woman, aged 21, who had acquired syphilis two years before. She had secondary manifestations, followed several weeks afterwards by severe cephalic symptoms, consisting of bilateral deafness, left facial paralysis and very violent headaches. The disease had not been recognised for several months, and she had not had specific treatment for two years. The left eye commenced to grow misty towards the end of December, and became affected with a marked interstitial keratitis, the whole cornea being infiltrated and resembling ground glass. In spite of a very slight vascularisation, only the central zone remained opaque, the whole of the periphery having resumed its transparency, allowing the pupil to be seen widely dilated with atropine, except for two small synechiæ in the horizontal meridian. Treatment had consisted in mercurial inunction and the administration of iodide, and with the application of hot compresses and atropine locally. The right eye had remained unaffected.

The second case was that of a woman, aged 40, who had been under observation two years. Here, again, one eye had remained unaffected. She had acquired syphilis twenty years before, suffered a violent iritis in the right eye during the first year, and only received antisyphilitic treatment during that year. Two years ago the same right eye was attacked by an intense parenchymatous keratitis, which rendered the cornea entirely opaque.

After prolonged treatment by biniodide injections, alternating with a local intensive treatment, the keratitis ended by slowly clearing up, almost without vascularisation, and much more slowly than in the preceding case, perhaps by reason of the age of the patient and the duration of the syphilis. There now remained a kind of deep leucomatous tract across the cornea from top to bottom. The pupil presented numerous synechiæ, but the media and fundus were normal.

The author remarked that these two cases represented two typical cases of keratitis in acquired syphilis. Compared with the keratitis of hereditary syphilis it appears to be much more frequently unilateral, commoner in females, and the vascularisation much less.

M. Jocqs said that the cases were interesting both by reason of the absence of reactionary inflammation, and also from the point of view of the diagnosis of parenchymatous keratitis from simple cicatricial leucoma. As regards treatment, he preferred the administration of iodine and iodides to mercurials.

M. Vignes had not obtained any good results from iodine even in big doses in the form of subcutaneous injections.

M. Gorecki maintained that the fact that syphilitic lesions appeared during a mercurial course did not prove the inefficiency of mercury. Under such circumstances he found it most efficacious to change the mercurial preparation or have resource to guaiacum, sarsaparilla, or sudorifics. Mercury was not infallible in its action in interstitial keratitis. He believed in the local application of heat.

M. Chevallereau related two undoubted cases of interstitial keratitis in acquired syphilis, both in females and both unilateral.

M. Boucheron alluded to a case in a man which cleared up in five weeks.

M. R. Dreyer-Dufer. *On the Diagnostic Value of Ophthalmoscopic Spots of Degeneration.*—Of 250 cases examined, 42 presented more or less pronounced spots, *i.e.*, about 18 per cent., and out of this number there were only two concerning whom there was a certainty of specific antecedents. Out of the 18 per cent. affected, 10 per cent. were Jews, which agrees with the statement of Liebreich upon the predisposition of Jews to pigmentary retinitis. The spots were found especially in hypermetropic and astigmatic patients; seven times with strabismus, four times with simulated myopia, three times with nystagmus, once with anterior staphyloma, and once with binocular arcus senilis at 27 years of age. These different affections indicated an imperfect nutrition of the eye or body. In three cases there were corneal scars resulting from keratitis in infancy, and one case was scrofulous. Antonelli has remarked that there is not a true pathognomonic sign of syphilis; it is the aggregate of symptoms, and not one symptom, which makes the diagnosis clear. We have no right in the majority of cases to look upon these spots as due to hereditary syphilis, although they afford a suggestion, except in cases with well marked collateral signs.

M. Morax did not think the ascertained facts sufficient. He thought it more important to look for indisputable and obvious signs than to discuss the significance of these spots. The word degeneration in a general sense expressed nothing definite.

M. Parent asked if the pseudo-neuritis of Nottbeck was identical with that seen in hypermetropes.

M. Antonelli maintained that these spots were the result of intra-uterine or extra-uterine syphilis in the large majority of cases. The hereditary syphilitic child is nearly always affected with deep ocular manifestations (retro-bulbar neuritis, papillitis, retinal vasculitis, choroido-retinitis, &c.) which evolve in utero or during early infancy, and which always leave ophthalmoscopic traces.

M. Jocqs held that the discussion of these spots, whether they be called spots of degeneration or spots of hereditary syphilis, only had theoretical interest. There are numerous affections of the fundus in which, not finding any precise cause, we make use of anti-specific treatment because we believe it capable of curing other lesions than those which are syphilitic.

M. Dreyer-Dufer, in reply, said that Nottbeck made no distinction between the pseudo-neuritis he described and the hypermetropic neuritis described by the Germans. Seeing that hereditary syphilis was not the cause in the majority of cases, he held that in describing these spots as "spots of degeneration," instead of as "spots of hereditary syphilis," he had employed a vaguer definition, but one which was truer and broader, and which more exactly represented the facts.

M. A. Terson. *Acute Œdema of the Conjunctiva.*—The case reported affected one eye of a female, aged 45, who had had a previous attack. The swelling came on at night and was like that of a violent ophthalmia. The cornea was at the bottom of a funnel formed by the purple red chemosis, the upper lid was swollen but not red, and the patient could not open her eye. The cornea was perfectly bright, the pupil active, the vision perfect, and the tension normal. There was no discharge, and no trace of exophthalmos. The ocular movements were effected without pain or marked limitation, and there was only a sensation of weight. She was treated by purgation, mustard foot baths, and hot fomentations. Two days after being seen the condition had quite disappeared.

Reference was made to other cases, most of which were neuro-arthritic, and over the age of 20. The gastric condition should be particularly investigated. In this patient there was no error of diet, for she was being treated for an enormous dilatation of the stomach. The duration of the attack is variable. It may last two or three days, or occur several times in the twenty-four hours for several days. The chemosis may be very marked and unilateral, or slight and bilateral, and it is generally more pronounced below. Complete absence of pain is a pathognomonic sign, for it is the only conjunctival or orbital affection where such objective signs are accompanied by such slight subjective symptoms. The cause is variable and often indeterminate; it may be draughts of air or indigestion, but it is generally impossible to define it with certainty. The only analogous cases are those of conjunctival urticaria, but they are either preceded or accompanied by urticaria of other parts of the body.

M. Jocqs mentioned a case of acute œdema of the conjunctiva in a patient who was under treatment for subacute articular rheumatism. With a pressure bandage the œdema completely disappeared in about forty-eight hours. The absence of pain and preservation of ocular movements negatived rheumatic tenonitis.

M. E. Valude. *Expulsive Hæmorrhage after cataract Extraction. Reclination of the Lens in the other eye.* The case is described at length on page 107.

M. A. Terson remarked that expulsive hæmorrhage could result from a perforating ulcer of the cornea. The propriety of reclination was still not absolutely decided, in consequence of its possible dangers and difficulties.

M. Chevallereau related a case of hæmorrhage after extraction complicated with sympathetic ophthalmitis six weeks later. He thought that the presence of the lens floating in the vitreous body could of itself be a cause of glaucoma, especially in one predisposed to it. He thought it would have been safer to pass the needle through the cornea than through the sclera.

M. Parent thought that reclination might be adopted in certain cases of suppuration of the lacrymal passages and trachoma.

M. Vignes alluded to three cases of expulsive hæmorrhage following cataract extraction. He thought that reclination was certainly indicated in these cases, but that it should be regarded as an exceptional operation. He performed extraction several times on patients whose lacrymal sacs were full of muco-pus, and he had found that washing out the sac prior to operation was a sufficient precaution. He believed that expulsive hæmorrhage was the result of a pre-existing chronic glaucoma.

M. Gorecki mentioned a case of successful reclination, and also one of expulsive hæmorrhage after extraction of cataract in a glaucomatous eye.

M. Vignes showed the *Stereoscopic Cards* of Dr. Hegg, of Berne.

Dr. Baudouin. *A Case of Melanotic Sarcoma of the Choroid.*—The case was that of a young man, aged 18, whose eye was enucleated for choroidal melanotic-sarcoma causing glaucoma. There was no local recurrence, but the patient died sixteen months later with growths in the liver. The author came to the following conclusions:—

(1) Choroidal sarcoma does not spare the young.

(2) All retinal detachments, which cannot be ascribed to trauma, myopia, or choroidal disease, should lead us to suspect a neoplasm.

(3) The development of glaucoma should not be awaited before intervening.

(4) The size of the tumour, the intensity of pigmentation, the thinness of the ocular tunics, and their perforation, all tend to darken the prognosis.

(5) Early intervention is the best.

(6) The exenteration of the orbit, even when the eyeball is not perforated, may be perhaps safer than enucleation.

The author, however, advises enucleation first, and exenteration in two or three days, if the histological examination of the tissues bordering the sclerotic gives rise to the least suspicion. L. V. Cargill.

ON THE MOBILITY AND POSITION OF THE ARTIFICIAL EYE AFTER ENUCLEATION.

By PRIESTLEY SMITH.

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THE operation of enucleation, safe, simple, and beneficent as it is, has certain well-known drawbacks: the artificial eye with which we attempt to restore the natural appearance of the face moves imperfectly, and sometimes not at all, and assumes a more or less sunken position. Any measures which enable us to do away with the drawbacks, without impairing the advantages which this operation has over the substitutes which have been introduced from time to time, are of manifest importance.

The mobility of the artificial eye will vary with the way in which the excision is performed. If the conjunctival bed on which it will rest is to move in association with the remaining eye, its connections with the muscles, and the integrity of these latter, must be preserved with the utmost care. This is sometimes overlooked. Those who have had frequent opportunities of examining excised eyeballs know that even experienced operators differ considerably in the cleanness with which they separate the globe from the parts around it. One sometimes finds considerable masses of tissue, and even considerable portions of tendon, attached to the globe. Excision is regarded as an

Ophth. Review. Vol. XVIII., No. 211, May, 1899.

easy and safe operation, and so it is, but the beginner whose attention has not been called to the point here in question is not likely to obtain much mobility in the artificial eye. The descriptions of the operation to be found in text-books differ also considerably. A few writers urge that the connections of the tendons with the conjunctiva and connective tissue should be preserved as much as possible, in order to prevent the retraction of the tendons. Meyer, especially, has lately given a minute description of the precautions which are necessary to this end.[1] But the majority lay little stress on the matter. Some speak of undermining the conjunctiva and exposing the tendons; others, following Arlt, recommend the cutting of one of the tendons in such a way as to leave a stump attached to the eyeball.

The first point of importance unquestionably is to divide the conjunctiva all round as close to the margin of the cornea as possible, and to undermine it as little as possible. This cannot be done with a few bold cuts with the scissors as some advise, but demands a minute and careful snipping with the help of fine forceps and fine scissors. The next step is to get access to the insertions of the tendons, to pass a small hook beneath them, and to divide them close to the sclera, with the least possible disturbance of Tenon's capsule. It will then happen not seldom that the aperture in the conjunctiva and subjacent fascia proves too small to permit the passage of the globe through it. It must be enlarged by one or more radial snips, and these, as Meyer suggests, should lie not where the muscles are situated, but between them. The globe is then made to protrude by pressing the speculum backwards, and is freed from its remaining connections by dividing these close to the sclera and with as little dragging and tearing as possible.

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[1] *Revue Générale d'Ophtalmologie*, No. 5, 31 Mai, 1898.

So far there is hardly room for difference of opinion. As regards the use of sutures to the conjunctiva the case is different. Many surgeons use none, and in the great majority of cases smooth healing occurs. Meyer unites the conjunctival edges by vertical sutures only, and holds that the use of horizontal sutures is disadvantageous, inasmuch as it approximates the divided extremities of the internal and external recti, and thereby diminishes their action on the bed of conjunctiva, and with it the most important movement of the artificial eye, that, namely, which takes place in the horizontal direction. Czermak, as quoted by Knapp, says, "I avoid all suturing of the conjunctiva, because it is unnecessary, does not accelerate the recovery, and always occasions a greater diminution of the stump."[1]

H. Schmidt has lately advocated a novel proceeding, the object of which is to ensure a firm connection between the tendons and conjunctiva by means of sutures.[2] His method is essentially as follows: The conjunctiva having been divided all round the cornea, and undermined to the extent of about 1 cm., each rectus tendon in turn is seized with forceps, incised without being completely divided, and secured by means of a catgut suture passed through it. This being done the tendons are completely divided close to the sclera. A slit is now made in the conjunctiva over the middle of each muscle. The enucleation is then completed; each tendon is sutured into the corresponding slit in the conjunctiva, and the latter is drawn together and united by a continuous suture, which gives a vertical and horizontal line of stitches forming a cross, to the extremities of which the four tendons are attached. The result is said to be a considerable advantage as regards the mobility of the artificial eye, and a diminished degree of sinking.

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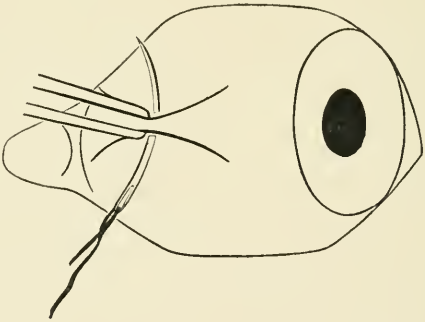
[1] Czermak: *Die Augenaerztlichen Operationen*, p. 418; and Knapp, "Operations, &c., System of Diseases of the Eye of Norris and Oliver," vol. iii., p. 886.

[2] *Klin. Monatsbl. f. Augenheilk.*, November, 1897, p. 383; see abstract in OPHTHALMIC REVIEW, 1897, p. 388.

Acting on Schmidt's idea, but applying it in a different manner, I have, during the last fifteen months, sutured the tendons, or some of them, to the conjunctiva in a considerable number of cases, and have obtained results which certainly justify further trials. The sutures are easily applied and add nothing to the suffering of the patient or to the period occupied by recovery. Their application is the first step in the operation. The speculum having been introduced, the globe is rotated strongly outwards either with forceps or, more conveniently in some cases, by pressing the convexity of a strabismus hook deeply into the sulcus at the external canthus. A narrow horizontal fold of the conjunctiva over the internal rectus is then pinched up so as to include the subjacent connective tissue and muscle, and a black silk suture is carried through these structures by means of a curved needle, as shown in the diagram. To pinch up the muscle it



is necessary to use very fine forceps with sharp teeth, like those introduced by Stevens, of New York, and to press the tips firmly into the tissues. The suture is then tied firmly, but not too tightly, with a double knot, and cut off not too short. A second suture is applied in like manner to the external rectus. The upper and lower recti may be treated in the same way, but this is of less importance. The enucleation is then carried out with the precautions above referred to, and with special care not to cut the sutures while severing the attachments of the tendons. Lastly, the conjunctival aperture may or may not be closed by one or more vertical sutures.

Experiments on the cadaver have shown me that sutures carefully introduced in this way do actually pass through some portion of the muscle. The nearer to the canthus one places the tips of the forceps the easier it is to make sure of picking up the muscle, but if the suture be placed too near to the canthus the movement of the conjunctiva may be restricted rather than increased. A distance of from 10 to 12 mm. from the corneal margin is, I think, the best.

Patients treated in this way have usually left the hospital, as in the case of ordinary enucleation, on the fourth or fifth day. The sutures have usually been removed about a week later.

The effect of the sutures during the first few days after the operation is certainly to give a greater mobility to the conjunctival bed than is usual after an ordinary enucleation. How much of this advantage is permanently retained after their removal it is difficult to say, for we sometimes see excellent mobility after a well performed ordinary enucleation. On the whole, however, I feel confident that some advantage is gained. Comparing cases, for example, in which the four recti were sutured, with others in which only the internal and external were thus treated, I found tolerably clear evidence that the use of the suture gave increased mobility.

As regards the other fault, the sunken position of the artificial eye, we have an unquestionable gain in the new thickened eyes introduced by Snellen.[1] Through Professor Snellen's kindness I had the opportunity of using several of these before his account of them was published, and can speak strongly in their favour. The sunken appearance is practically done away with, and the smooth rounded contour banishes one of the chief objections to the old thin-edged shell. The new eyes, originally made by Messrs. Mueller, of Wiesbaden, are now being made also by Mr. Pache, of Great Charles Street, Birmingham.

A point of much importance in the making or selection of artificial eyes is that they should be less conspicuous and less attractive in all respects than the real eyes which they are supposed to match, however lustreless these latter may be. Makers err in this matter probably through a natural pride in producing good-looking eyes. Patients hardly realise that an eye may be too good-looking for their purpose. The "white" of the eye should be no whiter, the pupil no blacker, the corneal margin no better defined, and the whole visible portion even a little smaller than in the real eye. In all these points the artificial eye is frequently at fault, so that we recognise it rather by its superior size and brilliancy than by its defect of prominence or mobility.

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[1] Ophthalmic Review, December, 1898, p. 247.

GRANDCLEMENT (Lyons). **The Treatment of Scleritis.** *La Clinique Ophtalmologique, February* 10, 1899.

In the recent paper by Dr. Pansier, of Avignon, upon the Treatment of Episcleritis by Electricity, published in the *Archives d'Electricité Médicale*, Grandclément is much astonished not to find any mention of the treatment of episcleritis by sub-conjunctival injections of cyanide of mercury; nor is there any mention of this treatment in the latest treatises on ophthalmology. In praise of this method he is enthusiastic; its application, he says, is easy and simple, and is rapidly and almost certainly successful in this serious and chronic affection, which very often resists all other medicaments; during the eight years he has used it, scleritis has caused him no anxiety. Episcleritis is less serious than anterior sclero-choroiditis; both these forms appear generally between the ages of 40 and 50, and most often in females about the menopause.

Until recently treatment has been almost futile; the efficacy of medicinal treatment in particular, which was directed against their presumed etiology, gout or rheumatism, and which consisted in the employment of alkalies, salicylates, or colchicine, is very doubtful. Surgical treatment, including scarifications, the excision of the episcleral bouton in episcleritis, the actual cautery and iridectomy in anterior sclero-choroiditis, produced sometimes a more manifest improvement, but often only for a time. During the last eight years Grandclément has treated scleritis by sub-conjunctival injections of cyanide of mercury, and is able to affirm that this treatment succeeds rapidly and almost infallibly. Generally the malady yields to three or four injections, especially anterior sclero-choroiditis, the most serious and persistent variety. Naturally there are some relapses, but one or two fresh injections suffice to cure them.

Perhaps in episcleritis the efficacy of the injections is less rapid and less evident. This is explained by the fact that it is in affections of the uveal tract that they are most potent. It is, however, none the less true that with a continuance of the injections in episcleritis an equally good result is obtained, although this may require longer persistence in carrying out the treatment. At the same time, if the latter variety of scleritis unduly resists mercurial injections, recourse may be had to direct galvanisation, to electrolysis, or to "transpalpebral electrification"; but the last procedure, although less painful, is more protracted and uncertain. He admits that he has never employed electricity in episcleritis, but is nevertheless persuaded that it gives results less brilliant and less rapid than mercurial injections. Moreover, these injections do not require any instrument other than an ordinary Pravaz syringe. The strength of the solution of cyanide of mercury employed by him is 1—1,500. As regards anterior sclero-choroiditis he is equally convinced that electricity is powerless, and that the injection of cyanide is a certain remedy. The method advocated so warmly may be very valuable, but whether that be so or no, the older methods of treatment have not in our hands proved so worthless as they seem to be regarded by the author.

L. V. CARGILL.

A. WESTPHAL (Berlin). A hitherto undescribed Pupil - phenomenon. *Neurologischer Centralblatt, February* 15, 1899.

J. PILTZ (Zürich). New Pupil-phenomena. *Neurologischer Centralblatt, March* 15, 1899.

The pupil-phenomenon described in Westphal's paper was demonstrated by him in a series of patients from the *Charité*, at a meeting of the Berlin Psychological Society in January. It consists in this: when the *orbicularis palpebræ* muscle is thrown into energetic action the pupil becomes narrower. Of the conditions appropriate for the occurrence of this contraction, the most important seems to be a pupil which is either inactive to light or whose light reflex is very sluggish, but which is not already contracted.

The movements of the eyeball which occur as the eyelids are closed were first described by Charles Bell, and soon afterwards by Bernhardt. Sänger and Wilbrandt subsequently noted the position of the globe in the various stages of attempted closure of the lids in cases of facial palsy.

Bernhardt, examining healthy people, found that "in gentle closure of the lids the position of the eyeball did not alter, but in forcible closure it was rotated upwards. If, however, the closing of the lids was actively opposed, the eyeball was rolled upwards and (generally) outwards." This is the best method of eliciting the pupillary reaction described by Westphal. The patient should endeavour to close the lids, which are held apart by the observer; the effort to shut the lid is accompanied by movement of the globe (upwards and outwards) and narrowing of the pupil.

Westphal has found this pupillary reaction in cases of paralysis, tabes, syphilis of the central nervous system, &c., in which there was reflex irido-plegia, with a dilated or fairly wide pupil. It can also be elicited in instances in which, although immobile to light, the pupil reacts well in convergence and accommodation, or where the latter reaction is reduced to a minimum.

The degree of myosis which occurs varies considerably; it is sometimes very trifling, at other times so marked that the diameter of the pupil is reduced by half or even more.

A large number of healthy individuals, patients suffering from functional nerve troubles, were examined, and in one only, a case of hysteria, could the narrowing of the pupil be seen. In this case the pupils reacted promptly to light.

The fact that in nearly every case the rotation of the globe which occurs is in an upward and outward direction excludes the possibility of efforts at convergence and accommodation being responsible for the contraction of the pupil;

the suggestion that unknown changes in accommodation might call forth the phenomenon seems negatived by the observation that it occurs in cases in which the reaction of the pupil in accommodation, as shown by all ordinary tests, is reduced to a minimum. Westphal's opinion is that the chief factor in the production of the pupillary contraction is the innervation of the orbicularis muscle. He considers the myosis which occurs with forcible closure of the lids as comparable to the upward and outward movement of the eyeball described by Bernhardt, and others as associated with the action of the lid muscle. In reference to this Bernhardt says that the nerve impulse which induces closure of the lids by way of the facial nerve also excites contraction of one or more muscles of the eyeball, *e.g.*, the inferior oblique, or rarely the superior rectus.

According to Westphal's observations, the sphincter muscle of the iris and the pupillary branches of the oculomotor nerve are influenced in a similar way, and to a remarkable degree. Hence a pupil, movements of which are no longer induced by efforts of convergence and accommodation, is excited to contraction by forcible closure of the eyelids.

The author agrees with Bernhardt's statement "that our knowledge of the connection between nerve paths in the central nervous system is still very inadequate," and concludes his article by referring to the anatomical fact established by Mendel's investigations (in rabbits, &c.), that the ultimate origin of the facial nerve is from the third nerve nucleus. There are clinical indications that this is true of the human brain also, and Westphal's new pupillary phenomenon may not improbably depend upon an anatomical connection between the facial and oculomotor nerves.

Piltz's article, appearing a month later than Westphal's, is a record of some unpublished observations made in the latter part of 1898, and concerns the alteration in the size of the pupil occurring during closure of the eyelids. The results he obtained are in some respects similar to those recorded by Westphal, but do not agree with them in all particulars.

An important point in his paper is his record of the fact (of which Westphal was apparently ignorant) that Wundt and Gifford have both described the pupillary reaction observed by Westphal and himself. So long ago as 1880 Wundt wrote about the rotation of the eyeball upwards and inwards which occurs when the lids are voluntarily closed; and noted that coincidently with this rotation a narrowing of the pupil took place. Gifford published a note upon an orbicularis-pupil-reaction in the *Archives of Ophthalmology* in 1896.

Piltz describes two varieties of pupil-reaction associated with contraction of the orbicularis muscle. Symptom I. is as follows: if the eyes are voluntarily and tightly closed, and then reopened, the previously dilated pupil is found contracted; it slowly regains its former size.

Symptom II. is the contraction of the pupil which occurs when forcible attempts are made by the patient to close the eyelids, these attempts being frustrated by the observer holding the lids apart.

In 25 individuals in whom Symptom I. was present, 9 had pupils inactive to light, 10 had pupils acting sluggishly to light, and in 5 the pupillary light reflex was good. (He does not account for the remaining case.) In only 1 out of 23 healthy persons was this symptom discovered.

In 42 persons exhibiting Symptom II., 11 had pupils inactive to light, 12 had sluggish, and 17 had active pupils. This symptom Piltz found in 8 out of 23 healthy persons, *i.e.*, in 35 per cent.—a result which is in marked contrast to that obtained by Westphal.

He agrees with Westphal that this pupil-phenomenon is best shown in cases in which the pupils are not very small, and are either immobile or very sluggish on illumination. J. B. L.

R. HILBERT (Sensburg). The Spontaneous Absorption of Cataract. *Die Ophthalmolog. Klinik, March* 20, 1899.

Hilbert publishes notes of the case of a man, aged 65, under his immediate observation, in whom absorption of senile cataract occurred. He gives references to most, if not all of the authenticated cases, and including his, the list numbers about 27. Instances of the recovery of sight in patients with senile cataract are referred to by several of the older writers, but it is only in the last fifteen years or so that definite knowledge of the occurrence has been gained.

Hilbert's case has an additional interest, in that the fellow eye showed a typical morgagnian cataract; this the writer considers confirmatory evidence of the statement made by Mitvalsky and others, that morgagnian degeneration is the first stage of the spontaneous disappearance of cataract.

Hilbert's patient gave the following history. His left eye had been defective since childhood. Seven or eight years before he came under observation, vision in this eye had rapidly failed, and was reduced to perception of light. The eye had never been wounded. For three years the right eye had been failing, and during that time the vision of the left had improved, so that it was the better of the two. He consulted Hilbert chiefly on account of erythropsia, which he had noticed for the first time the day before his visit.

The pupils were equal, circular, and reacted slowly to light. The left eye was aphakic, and the pupillary area clear, except for a few small, white capsular opacities shown by oblique illumination. The iris was tremulous, the cornea clear and free from scars. The fundus was plainly visible, and showed old disseminated choroiditis and atrophic changes in the optic disc. V. + 12 D. = $\frac{6}{60}$.

In the right eye there was a morgagnian cataract; the nuclear opacity measured about 3 mm. in diameter. Light perception and projection were accurate.

The patient declined operation on the right eye, saying that he would wait for it to recover as the left had done. Hilbert expressed the opinion that he would probably not be disappointed.

J. B. L.

[See also Schmidt-Rimpler, OPHTHALMIC REVIEW, 1899, p. 8.]

ETIENNE ROLLET (Lyon). *Traité d'Ophtalmoscopie. With* 50 *coloured photographs and* 75 *figures in the text. Paris, Masson et Cie.*, 1898.

This attractive little book, which is intended for students and practitioners, has much to recommend it. As stated in the preface, it is essentially practical, and an endeavour has been made to bring together, in a small compass (1) ophthalmoscopy in relation to the refraction of the eye ; (2) descriptions of the normal and pathological fundus oculi ; (3) an ophthalmoscopical atlas. This combination at once commends itself, for the study of ophthalmoscopy and of the refraction of the eye obviously should go hand in hand.

The size, small octavo, with 379 pages, makes it a very handy volume ; its utility, however, might perhaps have been increased by the addition of an index. The refraction of the eye occupies the first part of the volume, and is illustrated by numerous figures in the text ; most of these, until now, have been unpublished.

The second, and by far the larger part of the volume, is practically a descriptive ophthalmoscopic atlas. It opens suitably with three chapters on the normal fundus of the human eye. The drawings illustrating these chapters include the fundus of a negro and an albino respectively, the fundus of an eye with mixed astigmatism, and different degrees of physiological cupping of the optic disc. Diseases of the optic nerve, retina, and choroid, and malformations of the fundus, are treated of in four separate chapters. A short description of the fundus of the rabbit, cat, and dog, completes the volume.

The coloured drawings are remarkably good for this class of book: they were made from nature, most of them by the direct method of ophthalmoscopic examination, and represent the more common normal and pathological appearances of the fundus. It may be remarked that conditions so difficult to reproduce as the elliptical light reflex at the macula, shown on Plate V., had almost better be omitted from the illustrations, for at best any attempt to reproduce them can only give a very vague impression of what is actually seen by the ophthalmoscope.

Facing each plate is a short description of the drawing and of the case from which the drawing was taken.

Numerous references are given throughout the text. Altogether this is a useful concise work, more especially for those commencing practical ophthalmoscopy.

OPHTHALMOLOGICAL SOCIETY OF PARIS.

February Meeting.

Recueil d'Ophtalmologie, February, 1899.

M. Dreyer-Dufer showed a patient who exhibited a circinate form of syphilitic choroido-retinitis. This was a man of 33, the vision of whose left eye had never been very good; there was no family evidence of syphilis, but he himself had been infected at the age of 22. At the upper outer portion of the left fundus there was found an annular, intensely white patch, enclosing some punctiform hæmorrhages. This area was skirted and crossed by retinal vessels, and must therefore have been situated more deeply than the nerve-fibre layer of the retina; the whole patch was five or six times the size of the disc. By direct examination the small hæmorrhages were seen to lie round a minute arterial branch, like grapes on a stalk, and some of them showed the central light dot described by Mans as present in pernicious anæmia. Below and to the inner side were a few minute extravasations of blood and a patch of atrophy of the choroid, one spot of pigmentation being surrounded by a yellowish ring showing that it must have been very recent. The papilla was indistinct in outline, and of a dirty yellowish-white colour; the vitreous faintly turbid. The left pupil was somewhat dilated, but both reacted normally; the right eye, though vision was normal, presented at the periphery a few plaques of choroidal atrophy. Dreyer-Dufer thinks this case is in reality of the same nature as retinitis circinata, differing only in not affecting the macular area.

M. Jocqs could not agree that the circinate form of a retinitis was a sign of syphilis, and in this case in particular he rather thought the lesion was not "syphilitic," and that the circumstance that the patient had had that disease could only be regarded as an accident.

M. Valude described a case of the presence of a fibro-cartilaginous plate in the episcleral tissue of a child of 7½ years. The patch lay about the equator of the eye, between the superior and the external rectus; it formed a hard, flat, knotty tumour, about the size of a pea, movable over the sclerotic. As the growth, which had been observed at birth, had lately begun to increase in size, it was removed; this was effected without any difficulty.

M. Gorecki drew attention to the fact that cartilaginous and bony plates existed in this situation in some of the lower animals.

M. Jocqs read notes of three cases of interest:—

(1) *Division of the Optic Nerve by a Shot.*—A gentleman had been accidentally shot in the head and face, as one immediate result of which he had completely lost the sight of the right eye, which was prominent but not painful; there was no visible wound of lid, conjunctiva, or globe; movements were normal, and the pupil was not dilated. There was no p. l., and phosphenes could not be elicited, but the media were perfectly normal and the fundus and vessels appeared quite as usual. The pellet which had effected the damage appeared to have entered the upper inner angle of the orbit, passing downwards and backwards. Pallor of the disc was first seen three and

a half weeks after the injury, but the vessels had not diminished in size, a proof that the nerve must have been injured at a point posterior to the entrance of the artery.

(2) *Non-perforating Injury with a Particle of Lead; Large Hæmorrhage into the Vitreous.*—A man, aged 45, was shot from about sixty paces distance from behind, but he was in the act of turning his head round at the time, and a pellet struck the eye at a spot about 8 mm. to the inner side of the cornea. The shot had then ricoché'd, torn the inner surface of the lower lid, and escaped. Immediately vision was much damaged; ten weeks afterwards it was only $\frac{1}{10}$; and ophthalmoscopic examination showed the vitreous to be full of blood clots. Under the line of treatment about to be indicated as used for the next patient, vision improved till it became $\frac{2}{3}$ nearly five months after the injury.

(3) *Contusion of the Globe followed by Abundant Vitreous Hæmorrhage.*—The patient in this case had been replacing a saucepan upon its shelf, when it fell, and striking the glasses she was wearing, drove the unbroken left lens forcibly against the eye; vision became at once obscured. Next day the patient was able only to perceive movements, and not even that in the upper and inner parts of the field. This fact at once suggested a detachment of the retina, more especially as the patient was highly myopic. Ophthalmoscopically there was nothing to be made out, as the fundus could not be illuminated. As in the case of the preceding patient, treatment consisted in the subcutaneous injection of pilocarpin and the use of the continuous current. A month later the condition of affairs was much improved, and vision was returning; there were some curious striæ on the posterior surface of the lens, and there lay below, probably between lens and vitreous, a large blood-clot. M. Jocqs intended to carry on the treatment by subconjunctival injections of chloride of sodium.

M. Pechin thought it probable that some of the defect of vision in those cases was due to œdema of the retina.

M. Boucheron was much interested by the question of what effect upon the sensory condition of the cornea had followed upon the gunshot injury to the optic nerve, since it was certain that some at least of the ciliary nerves must have also been divided by the pellet. He had himself experimented on the subject, and had found that after division of the optic nerve and the accompanying ciliary nerves, sensation returned after a time to the periphery of the cornea, though not to the centre. This return of sensation to the cornea after division of the ciliary nerves he attributed to a sort of anastomosis of nerves, though certain authors regard it as due to regeneration of nerve fibres; the nerves which take up the duty he believed to be those superficial ciliary nerves which lie in the subconjunctival tissue, and never penetrate to the interior of the globe at all. He was of opinion that the cause of partial loss of vision after a trauma such as was under discussion might be the sudden temporary compression inflicted upon the papilla, or upon the nerve fibrils at the sclerotic margin by the impact of the fluid contents of the globe. He considered the iridoplegia not infrequently seen to be analogous in its causation.

COLLEGE OF PHYSICIANS OF PHILADELPHIA, SECTION ON OPHTHALMOLOGY.

Dr. George C. Harlan, Chairman.

Meeting, January 17, 1899.

Dr. de Schweinitz reported the results of *three operations for Ptosis*, performed according to the method described by Dr. J. O. Tansley (*Trans. Amer. Ophthalmolog. Soc.*, vol. vii., 1894-96, p. 427). The first was a congenital ptosis in an Italian boy, aged 11, in whom result was only tolerably satisfactory; the others were cases of traumatic ptosis, one of twenty years' standing (the levator having been cut), and the other of six weeks' duration (from a blow with a blunt instrument). In the last two cases the result had been excellent. In one of these patients, presented before the Section, the lid movements, six months after operation, were perfect. The levator, however, had regained much of its power.

Discussion.—Dr. G. C. Harlan had been pleased with his success in several cases in which he had operated according to the method suggested by Grandclément, Dr. C. A. Oliver also preferred this method in the congenital and paralytic types of ptosis, but advised against the use of chromatised catgut on account of its tendency to denude the cornea of its epithelium. In true traumatic ptosis he preferred, as he had successfully done in two instances, to find and resect the levator muscle.

Dr. Charles A. Oliver gave the history and described the specimens of an almost unique form of injury to the optic nerve by the passage of a *Piece of Steel completely through the Eye-ball and the Optic Disc*, the metal being found almost wholly situated in the optic nerve outside of the eyeball. Immediately after the accident, vision, with the exception of a small field of light-perception, situated down and out, was absolutely lost; this led him to hazard the assumption of involvement of the outer and lower portions of the optic nerve in the traumatism, which was afterward proved to be so by *post-mortem* examination of the parts. The case is interesting by reason of the character of the traumatism; the comparative rarity of the position of the point of exit of the metal; the correctness of the clinical opinion, based upon the character of the vision, of the actual involvement of the optic nerve; the inability of a powerful magnet to withdraw the foreign body back into the eyeball; and the anatomical proof of the correctness of the judgment that blindness would have become complete if the eye had been let alone.

Discussion.—In 1893, Dr. de Schweinitz was consulted by a gentleman for atrophy of the left eyeball and irritability of the right eye, possibly from sympathy. Seventeen years before, the patient had been struck with a sliver of iron in the left eye. At the time of examination he had a 4 mm. scar in the ciliary region of the sclera, extending into the cornea, annihilation of the anterior chamber and tenderness in the ciliary region. No light-perception. The symptoms in the right disappeared after the correction of an error of refraction. During the enucleation of the left eye difficulty was experienced in cutting the optic nerve. After extirpation, a piece of steel 1 cm. by 3 mm. was found imbedded in the sclera and optic nerve. Dr. Harlan related a similar experience.

Dr. Hansell detailed the case of a young man shot through the right eye. The X-rays located the shot in the orbit slightly posterior to the globe. Under expectant treatment the inflammation subsided, and the eye remained quiescent for several weeks. Then symptoms of sympathetic irritation developed, and the injured ball was enucleated. Upon examination the shot was found lodged in the optic nerve. This case seems to substantiate the claims made recently that sympathetic ophthalmia may arise from injury directly to the nerve, and be conveyed by means of the lymph channels of the optic nerve to the tract, and thence to the sound eye. But it must be remembered that in most cases, as in this one, the anterior structures have been seriously damaged, and the origin of the sympathetic involvement may well be the ciliary region, which, it is universally admitted, is the "danger zone."

Dr. Harlan reported a case of *Splinter of Iron in the Eyeball*, with iritis and hypopyon, located by the X-rays and removed with the electro-magnet. A machinist was struck in the right eye by a chip of iron from a cold-chisel, nine days before he presented himself at the Wills' Eye Hospital. Although suffering considerable pain and loss of vision, he had simply bound up the eye and continued his work. He had a small scar near the temporal border of the cornea, in the equator of the ball, iritis with posterior synechiæ and hypopyon, and haziness of the lens preventing a view of the fundus. In the middle of the outer half of the iris, behind the corneal scar, a small bead of lymph seemed to hide a penetrating wound, and streaks of opacity, extending from the temporal to the nasal side of the lens, suggested that a spicule of iron had passed through it and lodged in the fundus. Dr. Leonard, of the University laboratory, reported that a long, narrow splinter of iron was lodged just behind the iris, transfixing the margin of the lens. An incision 5 or 6 mm. long was made through the cicatrix in the cornea, and the large, blunt electrode of a Hirschberg magnet was applied against it externally, when an iron splinter 10 mm. long and 1 m. wide was promptly extracted. Ice was applied for a few days, and the patient left the hospital with the eye nearly quiet and no other disability than a cataractous lens. Attention was called to the fact that the lens and vitreous afford the most favourable field for the removal of foreign bodies by the magnet after the lapse of considerable time, as they do not become involved in dense cicatricial tissue, as when lodged in the choroid. The skiagraph was shown of another case in which a chip of iron was found, after enucleation, imbedded in the choroid near the optic disc, where it had been for three weeks. It was so firmly incased in scar tissue that the magnet had no effect when applied directly, and quite a tedious dissection with the scissors points was necessary to release it. It is not probable that it could have been dislodged even by a Haab magnet.

Foreign Body in the Lens located with Roentgen Rays.—Dr. de Schweinitz read the notes of a case of foreign body (a piece of steel) in the lens, which had remained quiescent for nearly fourteen months (the lens being partially cataractous), which was accurately located by the X-rays according to Dr. W. M. Sweet's method. When the pupil was widely dilated this piece of steel could be seen in the upper part of the lens, but could not be seen when the pupil had returned to its natural size. In other words, the localisation with the ophthalmoscope and with the X-rays was identical, and the case was presented as an admirable demonstration of the value of Sweet's method.

Dr. M. W. Zimmerman reported a case of *Linear Rupture of an Ulcerated Cornea followed by a Large Intraocular Hæmorrhage*, occurring in an eye previously damaged by glaucoma. The loss of corneal tissue involved about one-half its thickness and almost its entire area. No operation had been performed in the tissue that subsequently ulcerated. On the sixth day, while still wearing a pressure bandage, and with no history of direct injury, there was a sudden rupture of the thinned cornea, almost horizontal in direction and about 7 mm. long, through which appeared a large hæmorrhage, carrying with it the crystalline lens. Enucleation was necessary, and the specimen demonstrated the above facts. The patient was a healthy working-woman, aged 56.

Discussion.—Dr. Wm. F. Norris stated that linear rupture after glaucoma was not very unusual. He had enucleated a glaucomatous eye in which a violent hæmorrhage had occurred, and in the examination of the ball could determine no special cause.

Dr. Oliver considered the case of Dr. Zimmerman to be one of the terminal stage of glaucoma. As illustrating this type, he cited the brief details of the case of a woman who had recently come under his care, in whom the right eye had passed on to such a condition just before his seeing it, while the left, which was saved by prompt local treatment and appropriate general measures from an attack of acute hæmorrhagic glaucoma, had its vision restored from a small area of light-perception to almost full acuity in a large field.

Dr. H. F. Hansell and Dr. Wm. G. Spiller reported two cases of *Unilateral Total Ophthalmoplegia*, crossed hemiplegia being associated with the ocular paralysis in one case.

The first patient described had received a punctured, transverse wound in the lower lid of the right eye from the thrust of an umbrella ferrule, about six months previously. The wound was just above the margin of the floor of the orbit, and when the man was examined shortly after the injury had been received, he was found to have complete ophthalmoplegia of the external and internal muscles of the *right* side, loss of sensation in the distribibition of the ophthalmic division of the right fifth nerve, paralysis of the left side of the face and of the *left* extremities. Indications of slight œdema of the right optic nerve were present for a short time.

Six months after the beginning of the trouble the muscles of the exterior and interior of the eye and of the left extremities had, to a great extent, regained their normal power.

The complete paralysis of the third, fourth, ophthalmic division of the fifth, and sixth nerve, with the escape of the optic nerve, led the authors to conclude that the injury had been received at the sphenoidal fissure. Associated movements occurring in the paralysed limbs were referred to and discussed. The transitory exophthalmos was explained by the loss of tonicity in the external muscles of the eyeball. The crossed hemiplegia was believed to be due to a lesion in the upper part of the right side of the pons, or in the right cerebral peduncle, or at the inferior part of the right internal capsule.

The second case was one of injury at the inner third of the supra-orbital ridge on the left side. At the time of the examination, several days after the injury, marked depression was noticed at the site of the injury, indicating a fracture of the anterior plate of the frontal sinus. The man had partial loss of vision, diplopia, and total inability to move the eyeball. The area supplied by the supra-orbital nerve was anæsthetic. Ptosis was not present. The pupil was dilated and immobile, accommodation was lost, and numerous hæmorrhages into the retina were found. The loss of sensation in the skin on the left side of the forehead was explained by the injury to the supra-orbital nerve, and the total internal and external ophthalmoplegia by orbital hæmorrhage and exudation.

HOWARD F. HANSELL,
Clerk of Section.

Dr. George C. Harlan, Chairman.

Meeting, February 21, 1899.

Dr. C. A. Veasey exhibited a patient with *Atrophic Retino-choroiditis and Beginning Angioid Streaks in the Retina.* The patient was a male, 55 years of age, whose vision had been failing for two years. There were extensive retino-choroidal changes, especially in the macular regions, and following the course of some of the blood-vessels there were numerous angioid streaks, presumably due to former hæmorrhage. No cause could be assigned. The patient was a farmer, apparently in excellent health. He had no history of syphilis, and the urinary examination was negative.

Dr. G. Oram Ring reported a case of *Successful Irido-cystectomy*, made according to Knapp's method. The patient had been operated on for senile cataract six months before. Slow and complicated healing resulted in complete closure of the pupil and coloboma by the exudative products of irido-cyclitis. Light-perception and projection, the latter imperfect, were present. The operation was performed as follows: A horizontal incision 6 mm. in length, 3 mm. from the lower scleral margin, was made with a Beer cataract-knife through the cornea. After the blade entered the anterior chamber the handle was depressed and the point of the blade carried upward to that portion of the iris just below the yellow-white membrane that filled the old pupil and coloboma and the iris divided transversely 4 mm. The iris and the underlying exudative membrane were caught with a Tyrrell hook, drawn out through the corneal wound, and excised. Very slight reaction followed, and in three weeks vision with lenses equalled $\frac{20}{50}$. Dr. Ring had had only one case of irido-cyclitis in seventy extractions.

Discussion.—Dr. de Schweinitz said that among 194 operations for cataract of various kinds irido-cyclitis with drawing up of the iris and closure of the coloboma by a web-like membrane had occurred four times. First in the left eye of a woman, aged 70, from whose right eye a cataract had been extracted, resulting in normal vision: simple extraction; prolapse of iris on fourth day; irido-cyclitis; usual medicinal treatment; eye white and quiet six months later; vision equals counting fingers at one meter; operative interference positively declined. Second, a man, aged 60, a chronic alcoholic with chronic conjunctivitis: combined extraction: capsule opened with capsule forceps; typical irido-cyclitis, which was yielding to treatment when patient, at the end of fourth week, eloped from hospital; last recorded vision, five weeks later, $\frac{10}{200}$, a vision which has no doubt deteriorated, for patient was not again seen. From his right eye a cataract had been extracted by another surgeon years before and the eye lost by irido-cyclitis. Third, a woman, aged 65, with chronic conjunctivitis: combined extraction; on the fourth day, after traumatism in the night, wound found open and blood in anterior chamber; typical irido-cyclitis; ten weeks later eye quiet; vision with +12 equals $\frac{4}{150}$; operation declined. Extraction of cataract from the opposite eye two years before, by another surgeon, had also resulted in loss of the eye from irido-cyclitis. Fourth, a coloured woman, aged 50; cataract complicated with high myopia and capsulitis: combined and difficult extraction; moderate iritis, with thickened web in coloboma; vision with +10 equals $\frac{3}{150}$. Two months later modified irido-capsulectomy upward (not Knapp's operation); good coloboma, remaining for about a week, and nearly doubling of the previous vision, then gradual contraction of the opening, succeeded by an attack of irido-cyclitis of stubborn character, slowly yielding to medical treatment. Vision one year later, fingers at 50 cm.; eye white and quiet; normal light-projection.

Dr. de Schweinitz had seen one case of sympathetic ophthalmia, in the practice of a colleague, follow excision of the thickened membrane after irido-cyclitis. He had performed several operations on cases of irido-cyclitis which had come to him in the wards of the Philadelphia Hospital after cataract extraction elsewhere, and had always employed either Agnew's operation or De Wecker's iridotomy. In some cases there had been decided visual improvement, but none had reached so good a result as that reported by Dr. Ring.

Dr. Risley said that restoration of useful vision in case of closure of the coloboma after extraction by irido-cyclitis is comparatively rare. Left to themselves these eyes are subject to degeneration of the vitreous and atrophy of the ball. The fortunate result in Dr. Ring's case suggests the advisability of making, early in the case, an artificial pupil, in the hope that a restoration of communication between the vitreous and anterior chambers may arrest the degenerative process. He had often been disappointed in restoring vision by the presence of dense and abundant masses of exudate behind the iris, so strongly attached to the ciliary region that the procedure employed in this case must have caused dangerous traction upon the ciliary body.

He had never performed Knapp's operation as described by Dr. Ring, but had employed other procedures in different cases. In one, where the lines of traction were horizontal, a narrow cataract-knife was entered at the inner side of the chamber, and carried through the exudate at the lower border of the coloboma, which was drawn well up to the upper border of the cornea, and then downward, cutting through the rim of the pupil and making a vertical slit in the iris. The result was a triangular pupil, which remained open, but the dense exudate behind the iris impaired the visual results. It is not always necessary to take out a piece of the iris in order to secure a pupil. In one case he entered a cataract-knife just below the line of the original incision, perforated the iris, and divided the fibres horizontally across the line of upward traction. The immediate result was a horizontally oval pupil, which after a few days became nearly round.

He prefers entering the anterior chamber from above, as this does not require the rotation of the knife in the wound, necessitated by entrance from the side as suggested by Dr. Noyes, and furthermore, the mechanical advantages in perforating and dividing the iris fibres are greater.

Dr. Harlan had fairly successful results by cutting out a triangular piece of iris and underlying membrane by means of de Wecker's iridotomy scissors.

Dr. Ring exhibited a patient with *Rupture of Choroid and Optic Nerve* of the left eye, from injury by a base-ball four years ago. Vision was reduced to counting fingers eccentrically. The eye was quiet, and the condition of the fellow-eye was normal. There was no surgical nor cosmetic reason for operative interference, but the patient, who was a well-behaved, industrious boy previous to the accident, had become monomaniacal on the subject of his injury, and begged to have the eye removed. He had become unable to centre his attention upon any sort of work, because the scotoma invariably caught and preserved his attention. All treatment directed to his nervous system, and all efforts to exclude the eye from participating in vision by the use of ground glass and shades, &c., had been nugatory. The boy and the members of his family insisted that the removal of the eye would entirely relieve him. Dr. Ring believed the decision a very serious matter, regarding it as entirely possible that the fixed ideas concerning his eye might be transferred to the artificial eye, or to some other portion of the body, to which opinion Dr. Wharton Sinkler concurred.

Discussion.—Dr. de Schweinitz did not believe that the enucleation of the eye in Dr. Ring's case would relieve the mental symptoms, and related a case of mania as the result of blindness from non-painful chronic glaucoma, in which iridectomy, made in order to satisfy the patient, whose chief complaint was red vision, had not only failed to relieve her, but had seemed to aggravate the symptoms.

Dr. Risley had two similar experiences. In the first case the left eye was lost through a violent cyclitis, and was removed to relieve severe pain and disturbing photopsia. A year of two later the right eye passed through an identical experience, but in this instance not only was excruciating pain a factor which made excision advisable, but the photopsia developed into a red glare.

She said "she was living in a sea of red fire." Her mental condition became distressing. The second eye was then removed, but without in the least correcting the photopsia, although the pain was relieved. After a few fateful years she died insane. Can it be true that the original cyclitis was of central origin?

The second case was one of high myopic astigmatism. The patient, an otherwise healthy woman in early middle life, was surrounded by all the possibilities afforded by wealth. With correcting glasses she had normal acuity of vision in each eye, but she suffered from ocular imbalance, for which many tenotomies had been performed. She suffered from constant occipital headache, which radiated to the shoulders and down the spine, and would, on the least provocation, lead up to explosions of violent sick-headache, which would drive her to bed in a darkened room. She was the victim of nausea, palpitation of the heart, and other derangements of the nervous system, often culminating in attacks of hysteria. She came from another city with the request that he should remove one of her eyes. This he refused to do. With her correcting glasses and suitably adjusted prisms she had binocular vision as long as the eyes were held approximately in the primary position, but in passing through a crowded street, or where there were moving objects, she had confused vision and often diplopia, and would return to the house exhausted and sick. She returned to her home, however, with her glasses, but a month later wrote to make an appointment for the removal of one eye. This he declined, but a letter from her husband two months later informed him that an eminent ophthalmic surgeon had performed the operation, notwithstanding her normal vision in each eye, and that her symptoms had disappeared.

Dr. Hansell proposed hypnotic suggestion as a remedy, and Dr. Friebis enlarged upon its beneficent results as practised upon patients in the foreign clinics for nervous diseases.

Dr. David Riesman presented *A Case of Day-blindness* in a man, 53, engineer, who since June, 1898, had complained that all objects seen in daylight were indistinct, and seemed to be shrouded in fog, while by night his sight was unchanged. He could distinguish with ease the colours of the lanterns on the switches at night, but in the daylight could not see the colours of the signal-boards or the switches. The conditions of vision were variable, sometimes better, sometimes worse, but his constant complaint was of diminished vision by daylight. The ability to read fine type had been lost. Examination of the eyes by Dr. L. Brewer Hall: V. = R. $\frac{6}{8}$, L. $\frac{6}{30}$, in a light room, and not improved, but made decidedly worse, by lessening the illumination; pupils contracted, but responsive to light and in accommodation; lateral nystagmus in abduction; media clear; optic nerves partly atrophied; no colour scotoma. The study of the form and colour fields was unsatisfactory. In view of the patient's inordinate consumption of tobacco, the negative history of syphilitic or other infection, the normal station and knee-jerks, the absence of pupillary symptoms, and the presence of advancing optic-nerve atrophy, the symptoms were ascribed to toxic retrobulbar neuritis. The day-blindness was probably due to the consumption during daylight of more visual material than could be reproduced at night. Dr. Riesman considered the definition and etymology of the word "nyctalopia" given by Greenhill and adopted by most American writers to be correct, and that nyctalopia properly expresses night-blindness and hemeralopia day-blindness.

Discussion.—Dr. de Schweinitz called attention to the fact that in most cases of central amblyopia in which the papillo-macular bundle of optic nerve fibres was affected, day-blindness was present, and that vision was comparatively better at night because, the pupils being dilated, the periphery received greater stimulation. Dr. Risley held the same view—namely, that the unsatisfactory vision in strong daylight was due to the contraction of the pupil, which confined the images more exactly to the region of a central scotoma.

Some Cases of Choroiditis and Retino-choroiditis with Unusual Ophthalmoscopic Appearances.—Dr. de Schweinitz described a case of *Neuro-choroido-retinitis*, the ophthalmoscopic appearances of which were similar to those caused by thrombosis or hæmorrhage into the optic nerve-sheath, but the disease apparently had its origin in the choroid and occurred in a healthy man, 68 years of age, the lesions being symmetrical and extensive ; a case of *Retino-choroiditis* due to inherited syphilis, almost exactly resembling Förster's *Areolar Choroiditis*, except that the lesions were not specially grouped around the disc and in the macula, but were placed upon the nasal side and lower portion of the fundus ; a case of *Perivasculitis* and *Secondary Atrophy of the Disc*, associated with the most unusual pigmentation incrusting the peripheral blood-vessels, which occurred in a child, otherwise healthy, with the history that the ocular conditions had followed an attack of measles eight years prior to the eye examinations ; a case of chronic epilepsy in a syphilitic, with *Retino-choroiditis* and unusual distribution of the pigment in the periphery of the eye-ground in the form of small fringed flecks, being particularly massed above the disc and downward and inward.

Discussion.—Dr. Risley had seen one case, which was studied at the Wills Hospital by the President of the Section also, where the same ophthalmoscopic appearances were present as in Dr. de Schweinitz's first case. There was œdema or infiltration of the retina in the region of the optic nerve, spreading to and surrounding the fovea, which presented the cherry-red appearance as seen in embolism of the central artery of the retina. The eye was quite blind. The condition had come on almost suddenly, as a blurring of the vision, while the woman was engaged in ironing on a hot summer day. The blurring rapidly increased, so that in an hour or two she was unable to count fingers. She was placed in bed in the hospital, received a saline purge, and blood was taken from the temple and mastoid regions. Later, ascending doses of potassium iodide were administered. The retinal œdema disappeared in a few weeks, leaving only a few white dots in the macular region, and vision rose to one-fifth. The nerve then became atrophic, with steadily advancing concentric contraction of the field and loss of central acuity of vision. The patient is still under observation.

Also, a Case of Cured Sympathetic Iritis. — Dr. de Schweinitz, after referring to the gravity of the prognosis of sympathetic iritis and the comparative rarity of permanent cures, described a case of sympathetic iritis, or more correctly, irido-cyclitis, of the serous variety, associated with papillitis, which he had treated more than five years previously by enucleating the exciting eye (traumatic irido-cyclitis with retained foreign body) and administering protiodide of mercury and large doses of quinine, and in which there had been no relapse, the vision at the present time being normal and the man inconvenienced in no particular.

Also, Almost Total Detachment of the Retina of Three Months' Standing; Complete Re-attachment and Restoration of Function after Forty-eight Hours of Dorsal Decubitus.—The original cause of the detachment had been a blow upon the eye administered by the tail of a horse. The original visual field was only a small quadrant in the lower and outer portion, and vision equalled seeing movements of the hand downward and outward. After the rest-treatment of forty-eight hours vision rose $\frac{20}{70}$, with complete restoration of the visual field for white, blue and red.

Howard F. Hansell,
Clerk of Section.

THE USE OF DIRECT SUNLIGHT IN EXAMINING EYES WITH HAZY DIOPTRIC MEDIA.

By Edward Jackson, M.D.
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But few writers have mentioned direct sunlight as a source of illumination for examination of the eye; and these, only to refer to its unfitness. The reasons for its unfitness for the ordinary ophthalmoscopic examination are so obvious that they need not here be recounted. But they seem to have obscured the fact that for certain diagnostic purposes direct sunlight is superior to the light obtainable from any other source. Its intensity gives it a greater "penetrating power" than that of other kinds of illumination when the dioptric media are hazy or partially opaque.

The thought of danger to the eye from concentrating upon it the intense light and heat of the sun naturally occurs at this suggestion, and is emphasised by remembrance of the unpleasant sensations experienced on looking directly at the sun. But on closer consideration it may be noted that when looking near the sun the focusing of all its rays entering the eye upon a single point of the retina gives the most severe illumination to which the eye can be subjected. Yet most persons can glance at the sun without experiencing anything more than temporary discomfort; and the continuous looking at an object somewhat removed from the sun, but in such a position that the sun's rays are approximately concentrated upon a peripheral

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part of the retina, is not commonly followed by any bad effect. Cases of permanent injury from exposure to direct sunlight are rare, and only follow prolonged concentration of that light, often for many minutes, on the most sensitive part of the retina, usually while watching the sun during an eclipse. Yet in these cases objective lesions, or symptoms that could be noticed in an eye previously suffering from serious impairment of vision, are exceptional. (See paper by George Mackay, OPHTH. REVIEW, January, February, and March, 1894.)

In the diagnostic use of direct sunlight, as here proposed, no such harmful influence need be feared. The exposure of any particular part to the direct sunlight need not be prolonged, the accurate focusing of the light upon the retina is prevented, and even a slight haziness of the media renders impossible such a concentration of light as experience has shown to be injurious. The influence of haziness in the dioptric media in preventing the focusing or concentration of light is readily illustrated by trying to concentrate light through a layer of water rendered slightly turbid by the addition of milk, or of a little finely divided coagulated albumen. Even slight turbidity interferes with the concentration of the light, to an extent that will surprise one who has not tried the experiment.

To make the ophthalmoscopic examination with direct sunlight the pupil must be dilated, or at least unresponsive to light thrown into the eye. It is quite unnecessary to have a dark room; the patient may be placed in the sunshine with his back to the sun, or the light may be reflected into the consultation room at a convenient height by a mirror properly placed outside the window. To examine the anterior segment the mirror may be so held as to focus the pencil of rays somewhat in front of the eye. To study changes in the vitreous or the fundus it should be held so as to cause the rays to focus somewhere in the vitreous. The important point is to avoid concentrating the rays to an accurate focus upon the coats of the eye, or upon the skin of the face. The distance at which the mirror should be held will vary with its focal length ; but if there is decided haziness of the media it may with safety be placed anywhere within its focal distance from the eye.

This method of investigation is most effective when the point looked at is strongly illuminated and the media looked through are left in comparative shadow. Sometimes this is brought about by letting the illuminating pencil fall on a part of the pupil only ; sometimes by not looking through the sight-hole, but somewhat to one side of the mirror ; or it may be best to illuminate the eye, not through the pupil, but by concentrating the light (but not to an accurate focus) upon some portion of the sclera.

The writer has used this diagnostic aid for four years without causing unfavourable symptoms in any case. The risks attending its careless employment are so evident, and so much smaller than they seem, that it is not likely to be abused.

It does not enable the surgeon to see through all ocular opacities ; the penetrating power of even concentrated sun-light is limited. But where feebler illumination failed it has revealed through the clouded vitreous intra-ocular growths and detached floating retina. It has demonstrated the absence of such growths when the intra-ocular tension was elevated and the media hazy. It has shown large masses of floating vitreous opacity through a lens so clouded as to hide all fundus reflex and to indicate extraction for cataract. In a limited number of cases it has proved of a practical value that fully justifies its regular employment to extend the range of the surgeon's vision whenever this is curtailed by haziness of the media.

Clear direct sunlight is not always to be obtained, especially in many city offices. But the cases in which it is most needed are usually such as can wait for a favourable day, or are important enough to justify a special appointment at such time and place as the needful light may be obtainable. What has been said of direct sunlight is applicable in less degree to bright light from other sources.

WETTENDORFER (Graz). Further Cases of Complete Non-Senile Cataract occurring in Subjects of Tetany, together with a Contribution to the Histology and Histo-chemistry of Cataract. *Beiträge zur Augenheilkunde.* Bd. 38, 1899.

The theory of non-senile cataract which attributes it to a primary shrinking of the lens nucleus and to secondary changes occurring in the fluid expressed into the more peripheral layers has of late years received a large amount of support in Germany. Peters maintains further that the immediate cause of the shrinking of the nucleus is cramp of the ciliary muscle, producing a disturbance in the lymph circulation of the lens. As Hippel remarked in 1895 (Graefe's *Archiv.*, xli. 3), it seems odd that, if this be so, no connection has hitherto been observed between the employment of eserin and cataract, although when we reflect how seldom eserin is prescribed for long periods together, except to those past middle age, this argument loses some of its force. In support of this theory, Peters, in 1898, published two cases of juvenile cataract occurring in subjects of tetany, in which disease he supposes that the ciliary muscle is subject to cramp in the same way that other muscles are.

Wettendorfer had already published some similar cases in 1897, and in the present article he relates in detail two new cases of tetany-cataract.

The first occurred in a woman of 39, who had been subject to periodical cramps for five years, occurring at intervals of three or four days as a rule, but sometimes with remissions of months. The duration of each attack was from a quarter of an hour to a whole day. For the last two years the patient had noticed that at times her sight for distant objects became bad, a condition which had once lasted for five weeks before passing off. This was about a year before the patient came under observation, and soon afterwards her sight began persistently to fail. General examination failed to reveal any morbid condition except symptoms of tetany, viz., the facialis symptom (facial spasm on tapping over the facial nerve), and Trousseau's symptom (pressure over the principal vessel or nerve of a limb giving rise to spasm in that limb). Both lenses were almost totally opaque. Vision of both together was fingers at 30 cm. Both lenses were extracted, and the central part of each was sufficiently hard for pathological examination. The vision immediately resulting was $\frac{6}{18}$.

The second case occurred in a woman of 28, who for the previous three years had been subject to periodical attacks of cramp, occurring, however, only during the winter. For two years there had been considerable periods during which her sight for distance was bad, near vision remaining good, and this condition had always been present during the actual attacks of cramp. The vision of both eyes had been getting persistently worse for over six months.

Here, again, no general condition was found except the symptoms of tetany, viz., increased excitability of the part of the muscles of the extremities to the galvanic current, the "facialis sign" and "Trousseau's sign." Both eyes were cataractous with V = hand-movements, and only a trace of fundus reflex in each. Both lenses were extracted with a good result, but the nuclei were too soft to allow of examination.

The second and longer part of the article gives a detailed account of the pathological examination of the two lenses extracted from Case I., or rather of the central solid parts of them. Each consisted of a transparent yellow nucleus covered by a thin layer of whitish spokes extending from pole to pole and appearing thickest at the equator, intact on the posterior surface, but on the anterior partly destroyed by the needling of the capsule at the operation. During the subsequent processes of preparation some of these spokes became loose in their entire course from pole to pole when each appeared to be made up of several thin layers. The lenses were placed in 3½ per cent. nitric acid, then hardened in 70 per cent. alcohol and embedded in celloidin. A horizontal section showed a diameter of 7 mm. equatorially and one of 3·5 mm. from pole to pole. Serial sections were then made of each lens. To the naked eye these sections showed an ill-defined central cloudiness of the nucleus by reflected light, which, however, was not seen by transmitted light, and corresponding to which nothing was afterwards seen with the microscope. On the posterior surface of the nucleus, between it and the adherent cortex, a system of fine clefts was visible, these clefts extending to within a short distance from the equator on either side. On the anterior surface a broader layer of transparent cortex was in part preserved, which with a magnifying lens also showed fine clefts, a wider cleft dividing the cortex from the nucleus. In all the sections the anterior part of the nucleus appeared slightly opaque, and corresponding to this opacity fine irregularly arranged clefts could be seen.

Microscopical Examination.—Unstained sections mounted in glycerine showed a few little holes, mostly round and irregularly distributed in the nucleus, nothing like the number described as occurring in lamellar cataract (*e.g.*, by Lawford in *Trans. Ophth. Soc.*, vol. xii.). Some of these holes were empty, others contained a finely granular substance, while in others again the contained mass was homogeneous and globular, nearly, but not quite filling them. In the layers of the cortex which remained adherent towards the equator there were similar and rather larger holes. On the posterior surface, the clefts which had been noticed with the naked eye were seen to be crossed by oblique fibres and not to extend as far as the equator on either side. The more posterior clefts were occupied by a finely granular grey substance, while the contents of those bordering on the nucleus were homogeneous, colourless, and of low refracting power. Only a few of the clefts were completely filled. In most the contents took the form of well-defined bands at right angles to the direction of the clefts. Many of these bands appeared to be broken off short or broken in the middle, the two ends adhering to the walls of the cleft-like stalactites, while in some places a globular structure was seen accurately fitting in between the crescentic ends of two broken bands. In other places these structures appeared without any obvious relation to the bands, and of various shapes, round, conical, or irregular. The more irregular masses were generally of a waxy-yellow colour and more highly refracting; some had coarsely granular contents. Of these structures the most noteworthy appeared black under a low power, while under a high one they were seen to contain dust-like brown granules, either filling the whole except the margin, or collected near the centre, or else collected in a ring near the margin. These structures differed very much in size and shape, but on the average measured about 0·005 mm. in diameter. A few, found in the posterior cortex in central sections, and only in the more cataractous of the two lenses, were much larger. As numerous transition forms were observed between these various structures, the author infers that they show different stages in the degeneration of the originally albuminous contents of the clefts.

Wettendorfer next proceeded to stain the section with hæmatoxylin and eosin. The nucleus was stained red, with a blue shimmer, and the cortex blue. The contents of the spaces took the eosin stain almost to the exclusion of the hæmatoxylin; some of the globular structures stained well with eosin, others hardly at all. The structures which had appeared black or brown when unstained all took the stain well.

The author then proceeded to apply certain microchemical tests, from which he concluded that the bands and the great majority of the globular structures were undoubtedly albuminous, and that the dark granules, above mentioned as being contained in some of them, had undergone the hyaline degeneration.

The variations in the chemical behaviour of these different structures, no less than in their shape and appearance, as well as the number of transitional forms and their original formation out of the homogeneous substance composing the bands, made it certain that at any rate some of them were already formed *intra vitam*, and were not a product of the hardening process.

The whole research brings evidence in support of the view that spasm of accommodation may be a cause of cataract. It also supports the view that, in cataract so caused, a primary disease of the nucleus produces a rapid shrinking of the same; whereby an albuminous fluid is expressed between the layers of the cortex, which are thus mechanically separated. It further brings evidence to show that the liquid and albuminous contents of the clefts and holes so formed can, during life, undergo secondary degenerative changes. On the further question, whether, as Peters maintains, the same causes lie at the root of lamellar cataract, the present paper does not profess to throw any new light.

A. H. Thompson.

P. PETIT (Paris). A Peculiar Form of Serpiginous Affection of the Cornea. *Annales d'Oculistique, March*, 1899.

One has been apt hitherto to regard the staphylococcus and streptococcus as practically the only agents in producing corneal ulceration whether the lesion were primary, secondary to trauma, or secondary to conjunctival inflammation ; but this is an error. As a matter of fact, these are not even the most frequent agents, for Morax has shown that the corneal lesions occurring in the course of gonorrhœal, acute, or subacute conjunctivitis may often be due to a local direct action of the special micro-organism causing the primary inflammation. But it is rather with the forms which arise either spontaneously in the cornea or following slight injuries that Petit here deals, and in connection with which the labours of Uhthoff and Axenfeld are so well known. These observers proved the presence of the pneumococcus in sixty-nine out of seventy cases of serpiginous ulcer of the cornea, in one of their cases its presence was doubtful, though examination showed the existence of a large number of diplobacilli. In presence of these facts it seemed probable that all serpiginous ulcers of the cornea were due to pneumococcal infection, but certain observations of the author have cast some doubt on this opinion, and have led him to the conclusion that there is a second type of the disease characterised chiefly by the absence of pain, by the slower evolution, and by the comparative absence of iris complications. Microscopic and culture investigations showed in these cases the existence of an organism closely resembling, but in certain particulars differing from the diplobacillus of subacute conjunctivitis ; in each of the two cases examined there was obstruction of the lachrymal passages. That the microbe causing this form of corneal lesion is not the ordinary diplococcus, he concludes for these reasons among others :—because though that organism frequently causes corneal lesions, these have not the serpiginous type, nor do they lead to hypopyon ; certain of the reactions of this special microbe are different also from those of the ordinary form, for this bacillus does not take on Gram's stain, is cultivable in the ordinary media and serum, liquefies coagulated ox serum, and is not pathogenic to animals. He does not pretend to have as yet quite settled the question of whether it may not be an inhabitant, regular or occasional, of the nasal fossæ.

SHELFORD BIDWELL. On the Formation of Multiple Images in the Normal Eye. *Proceedings of the Royal Society*, *February* 16, 1899.

It is well known that a small bright object for which the eye is not accommodated often presents a multiform appearance, the number of separate images varying from about six to fifteen. It is also known that, as a result of disease or malformation of the eye, an individual may habitually see several images of a single object. The writer has found no reference in literature to certain curious visual phenomena which he investigated in the year 1897, and with which his present communication deals. It appears that under suitable conditions a normal healthy eye can see hundreds of independent images of a single point, an effect which probably results from the cellular structure of the lenses and the membranes associated with them.

In his earlier observations the object consisted of a small bright disc varying in diameter from 0·5 mm. to 8 mm., but it was subsequently found that much better results were obtained by using as the source of light the horseshoe-shaped filament of an electric lamp screened by a coloured glass.

When this was looked at through a lens, concave or convex, of about 6 inches focal length, from a distance of a few feet, the roughly oval patch of luminosity formed upon the retina appeared to be made up of a crowd of separate images of the filament, some brighter than others (as shown in the plate accompanying Bidwell's paper). The number was smaller if the observer was near the lamp, and greater if he retired from it or moved the lens further from his eye.

Thinking that the analysis of the luminous field would be facilitated if the attention could be confined to a small portion of it, Bidwell interposed an adjustable slit between the eye and the lens; the appearance presented by the filament, when seen through a slit $\frac{1}{80}$ inch wide and a convex lens of 5 inches focus, is shown in the plate referred to; a large number of more or less perfect, closely set images of the filament were visible.

Attempts were made to count the number of images, and to assist in this attempt the whole of the filament was screened from view except a very short portion of one limb, which was observed from a distance of 8 feet through the spectroscopic slit and a convex lens of 5 inches focus. According to the estimates of five different observers, the number of images varied from twenty to thirty. The images were not all equally bright, and the number in a row varied with the size of the pupil. If a lighted candle be held near the eye with which the observation is not being made, the pupil of the observing eye contracts consentaneously, and two or three images disappear from each end of the row.

If the distance between the eye and the luminous object be increased, or if a lens of shorter focus is employed, the multiple images become blurred and indistinct; at a distance of 20 feet, with a lens of 3 inches focal length, the separate images appeared to have coalesced, but the band of light was crossed by a large number of hazy dark lines at right angles to its length and at fairly equal distances apart. This led the author to think that the original images had been resolved into still simpler elements, and he endeavoured to ascertain how many elements were developed from each image. He concluded that the space corresponding to a single image was ultimately crossed by fifteen to twenty dark lines; hence assuming twenty-five images, the total number of elements would be four or five hundred.

Taking the diameter of the pupil when feebly lighted to be $\frac{1}{5}$ inch, these latter observations seem to indicate some fairly regular anatomical structure in or near the crystalline lens, and composed of cells measuring about $\frac{1}{2500}$ inch (0·01 mm.) in length or breadth. It has been suggested to the author that the endothelium on the anterior surface of the lens may be the structure responsible for these phenomena; its cells are polyhedral and flattened, but as they measure 0·02 mm. their dimensions appear to be too large. The author states that he knows of no structure sufficiently coarse-grained to account for the images of which twenty-five or thereabouts occur in a row. The mesh of a network which would explain these should be about $\frac{1}{125}$ inch (0·2 mm.) in length, and nothing of the kind is, so far as he is aware, to be found in the human eye.

The smaller number of images (six to fifteen) referred to at the beginning of the paper, and which have been often described, are undoubtedly due to the radial lines between the sections of the crystalline lens.

J. B. L.

CHARLES SAJOUS, M.D. (Editor). Annual and Analytical Cyclopædia of Practical Medicine. *Philadelphia: The F. A. Davis Co.*

The two first volumes of this large undertaking, these carrying one only so far as "Diphtheria," have reached us. In them there are but some half-dozen of articles which specially concern ophthalmologists; for these articles, however, one can have little but commendation. The book is most handsome, one might almost say sumptuous, in its style, and is evidently meant to be a work of great dimensions as well as great erudition. It is not easy to define its scope, for while when reading one page one supposes it intended as a complete treatise on the particular subject in hand, one finds essentials omitted from another. What is most important is printed in large type, and every here and there a paragraph is inserted in smaller type giving the essence of some more recent information, some suggestion, or minor conclusion, as well as the most recent literature on the topic. We notice here and there an unfortunate disposition to use these small paragraphs for the recording of "freaks," which is only human, but which ought not to be encouraged. The articles most likely to be attentively read by an ophthalmic surgeon are those on Cataract by Oliver, on Diseases of the Conjunctiva by Posey, and on Diseases of the Cornea by Jackson; the names of the authors are a guarantee of the excellence of their work. These papers are all very capable, and the statements therein may be relied upon as accurate on the whole. Under the heading of Zonular Cataract, however, we are informed that this form of cataract is slowly progressive and that "usually it is binocular."

DARIER (Paris). Traumatic Myopia. *La Clinique Ophtalmologique, April* 25, 1899.

No observer can fail to be struck by the disparity between the degree of damage to vision and the apparent extent of the injury in a number of the cases of simple contusion of the globe; some of these cases can be explained by commotio retinæ, but others again are caused by a temporary myopia. Of this condition Darier relates one or two examples which have come under his own observation, and of which we may give the particulars very briefly.

(1) A house painter, aged 32, received a violent blow on the left eye, which became injected, the pupil remained somewhat dilated, and vision both for distant and near

objects rather indistinct. When Darier saw him eight days after the accident the pupil was dilated by the atropine which had previously been used, but the cornea was uninjured, the media perfectly transparent, there was no evidence ophthalmoscopically of damage to the retina, and nothing, in short, to explain why vision was reduced to $\frac{1}{10}$. With – 6 D., however, the patient obtained full vision. Eserine was ordered with the view of counteracting the atropine which had been used, and at the same time the constant current was applied; whether as a result of the treatment or for a simpler reason, at all events recovery took place in a few days. The only explanation of so great an alteration in the refraction of an eye which satisfies Darier is a relaxation of the zonule and consequent increase in the antero-posterior diameter of the lens, causing a myopia which we might expect to be higher the younger the patient.

(2) A blacksmith, aged 42, was struck on the right eye by a large fragment of iron, which produced severe "commotio" without, however, any perforation. Four days after the accident, vision was found to be $\frac{1}{6}$, but with – 2 D. it rose to $\frac{1}{2}$; the other eye was lowly hypermetropic (+ ·75 D. V. = 1). The pupil of the injured eye was slightly dilated, but not unshapely, and the iris was not tremulous; there was a small rupture of the choroid with a few points of hæmorrhage between disc and macula. Three leeches were applied, eserine dropped into the eye, and electricity used as in the former case, and after a few days vision without glasses rose to $\frac{1}{3}$.

(3) A man of 40 stumbled and struck his eye violently against the door key; for four days the eye was too much swollen to be examined, but after that time he discovered that his sight was seriously interfered with. The pupil of the injured eye was slightly larger than that of the other, but reacted well to light; the media were quite normal. Vision was $\frac{1}{6}$ without glasses and $\frac{2}{3}$ with – 4 D.; the other eye had full vision without lenses. Retinoscopy showed hypermetropia of ·75 D. in the healthy eye, and myopia of 4·5 D. in the injured one. Instillations of eserine formed

the only treatment, and in about ten days the amount of myopia was only 1·5 D., and vision $\frac{2}{3}$. Several authors of note have discussed this lesion in text books, &c., but the pathology is not quite a settled matter, some attributing it to an over-stretching of the zonule, some to a rupture of it, some, when astigmatism is present, to hæmorrhages between the lens and the ciliary body, some to a spasm of accommodation. This last explanation, which is favoured by Schmidt-Rimpler, while it may be correct as regards cases in which the myopia is of very low degree, manifestly cannot be accepted for such a case as the first of those recorded above, both because the alteration in refraction was much too great to be explained in this way, and because the symptom persisted in spite of the free use of atropine, disappearing too under eserine. The present reviewer, like most other surgeons, has seen cases which entirely negative such a suggestion. In the cases recorded above there was no luxation of the lens, the myopia was simple; but in other instances, where the lens was dislocated, the proof that the lesion is due to suppression of the tensile compressive strain of the suspensory ligament is, according to Darier, even simpler. He relates a curious case of his own in which a man of 37 received a very severe blow on the left eye from a piece of wood; the anterior chamber at once filled with blood; the medical attendant employed atropine and blood-letting. Darier saw him two days after with a dilated pupil, which was oval with its long axis horizontal, the lens was dislocated outwards behind the iris so far that only $\frac{1}{3}$ of the pupil was occupied by lens. Eserine was instilled, and ten days later, though the pupil remained dilated, the lens had slipped back very nearly into its proper situation. Even Darier does not dare to flatter himself that this was to be attributed altogether to the eserine. As time went on vision improved, in spite of the fact that a large hæmorrhage overlay the macula, and a rupture of the choroid was present. Six weeks after the accident, however, he had an attack of acute glaucoma for which a large iridectomy was performed, and in the resulting coloboma one could afterwards see the upper margin of the lens. Now, in the course of all this, the patient, who appeared at the first examination which could be satisfactorily conducted, to have 7 D. of myopia, at the close had none, and obtained $\frac{2}{3}$ vision with a weak cylindrical lens only. In such a case there could manifestly be no question of spasm of accommodation; it seems that stretching and drawing upon the zonule so severely in some instances as to rupture it is the only possible explanation. Another point in this relation is not mentioned by the author, but seems to the reviewer to bear upon the matter: in cases of congenital dislocation of the lens, how is it that through that part of his pupil which contains the lens the patient so frequently is myopic in spite of the slight backward displacement of his crystalline, unless it be that the freedom from the compression of the zonule permits the lens to assume its attitude of maximum "accommodation," though the ciliary muscle cannot act upon it?

In such cases also, where medico-legal questions are involved, care should be taken not to give too grave a prognosis.

L. HEINE (Marburg). On Tremulous Movements of the Crystalline Lens. *Arch. f. Ophthal*, Bd. xlvii. Abt. 3.

Heine's article, which is mainly theoretical, has for a text a statement by Carl Hess, that he had on several occasions observed a tremulous movement of the image from the posterior surface of the lens in normal eyes during quick movements, and without active accommodation. This would seem to suggest that even in eyes with relaxed accommodation the lens is less firmly held in position than has been generally supposed.

Such an observation raises obvious difficulties to the acceptance of Helmholtz's theory of the mechanism of accommodation. How comes it that a loose lens can be influenced as to its curvature by the suspensory ligament. If, as in the cases observed by Hess, the eye was not accommodating for its near point, the zonule would not be fully relaxed (on the Helmholtz theory), and it does not seem probable that under these conditions the lens could be tremulous. Or, when these lens movements can be seen, how are we to suppose that there is sufficient tension of the suspensory ligament to keep the lens flattened?

Heine endeavours to reply to these queries. He accepts as an anatomical fact an annular origin of the zonula, situated between the equator of the globe and the sclero-corneal junction. For the purposes of explanation he considers the zonule as composed of two layers close together at this fixed point, but separated anteriorly by an elastic sphere (the crystalline lens) so placed that pressure is exerted upon it by these layers in front and behind; this pressure tends to flatten the sphere, while its opposing force makes the tension of the two layers of the zonula all the greater.

When the choroidal ring is drawn forwards by the contraction of the ciliary muscle, the zonule layers are relaxed, the pressure on the lens is diminished and its shape becomes more spherical; this increased sphericity tends to make the zonule tenser, and a fresh equilibrium is established between the zonule and the lens. A greater contraction of the ciliary muscle will still further relax the layers of the zonule and permit an increase of the convexity of the lens, until its maximum expansion is reached; then, if further relaxation of the zonule occurs, the lens by the force of gravity sinks between the layers; this sinking of the lens always occurs in an eye in which there is active contraction of the ciliary muscle.

This change in the position of the lens will take place in an eye which is still, but if the same conditions of the zonule and lens obtain, in an eye subjected to quick jerking movement, then the lens will exhibit tremulous movements.

Such tremulousness of the lens will be better seen in eyes in which the vitreous is relatively small, and the controlling pressure of the iris and of the vitreous humour does not fix the lens in position so securely as usual. The lens in such eyes would be more movable without complete relaxation of the zonule.

Clinical observation shows that there are wide variations in the rigidity of the suspensory apparatus of the human lens. It is conceivable that in some individuals the utmost contraction of the ciliary muscle is insufficient to relax the zonule to a degree necessary for the complete expansion of the lens; in such cases the range of accommodation should be small, and no movement of the lens would ever occur. In the majority of human eyes, however, it is probable that, in order to allow complete expansion of the lens, a contraction of the ciliary muscle considerably below its maximum is all that is requisite; hence, if the ciliary muscle acts fully, the layers of the zonule will be so slack that the fully expanded lens would tend to sink and be loose enough to show tremulous movements. In such eyes the application of eserine, although exciting an increased contraction of the muscle, cannot approximate the near point, because the lens can without the extra muscular efforts assume its greatest diameter. It is in such eyes that during active spontaneous contraction of the ciliary muscle, and more especially during the contraction induced by eserine, tremulousness of the lens can be easily demonstrated. Tremulous movements of the iris often seen in healthy eyes are possibly communicated from a tremulous lens.

In two examples given by Heine the tremulousness of the lens was increased by the use of eserine, and diminished by cocaine, and still more restricted by homatropine.

J. B. L

HANSELL AND REBER (Philadelphia). Muscular Anomalies of the Eye. *London: Kimpton*, 1899.

This little book, whose modest aim is to serve as a guide to "beginners in ophthalmic work," will, we think, be read with interest even by surgeons of experience. The section which will appeal most to the latter is that on heterophoria, or defective balance of the ocular muscles; it is evidently based on much clinical observation and is marked by a soberness of judgment which has not always been conspicuous in works dealing with this subject. The difficulty of the problem to be attacked is well stated in some of the opening sentences of this section: "We are brought face to face with the ocular complications of disordered health, of inherited or acquired abnormal susceptibility, of illogical and uncommon results of common causes, of individual idiosyncrasies—in a word, of unbalanced nerve-action. . . . Obstacles surround the examination and treatment of every case, and can only be overcome by repeated trials with modern diagnostic methods and the persistent applications of physiologic and conservative remedies. The *individual* element must not be lost sight of, and every factor, ocular or extra-ocular, that can have a bearing on the solution thoroughly investigated. The oculist is not the refractor or tenotomist alone, but is the physician as well." The methods of diagnosis are clearly described, and the lines of treatment, general, optical, and operative, are fully and temperately discussed. This section is decidedly the best in the book; some of the others seem to have suffered from over-compression. The chapters on anatomy and physiology, for example, however brief, should have been full enough to contain a description of the check ligaments of the orbit; while in that on ocular palsies we fail to find any reference to the important group of ophthalmoplegias of nuclear origin.

The chapters on manifest squints are adequate, and we may note, as an example of the authors' careful method, that in considering the operative treatment of ordinary convergent strabismus associated with amblyopia they insist that diplopia can always be obtained by persevering efforts and the squint measured subjectively, the frequently present vertical element being thus accurately determined. They advise that the vertical deviation should be treated first by dividing the superior rectus of the squinting eye, since excessive convergence often diminishes and sometimes disappears when this has been eliminated. If further operation is necessary they prefer moderate tenotomy of both internal recti, limited to the tendon insertion, with advancement of the externus of the squinting eye. The treatment would thus generally involve three tenotomies and an advancement, and admitting, as the authors do, that these procedures are carried out merely with the object of removing the deformity, we are not sure that many patients would not prefer a shorter even if less scientifically accurate method.

In spite of some blemishes we think the book is a good one, and likely to be helpful to students—more helpful possibly in some respects than Maddox's work on the same subject, inasmuch as it deals rather with patients in the flesh than with problems in physiological optics.

O. HAAB (Zürich). Atlas of the External Diseases of the Eye. *Lehmann, Münich*, 1899.

There are not many atlases of the external diseases of the eye, one good reason for which is the difficulty experienced in obtaining artistic skill sufficiently combined with medical knowledge to enable one to turn out good results. Haab, to whom we are already indebted for an atlas of ophthalmoscopic diseases, has now produced a very useful and thoroughly practical set of illustrations of various diseases of the external parts of the eye and of the eyelids. Any teacher of ophthalmology might with great benefit consult this little atlas of some forty pages of illustrations in colour. The subjects are well selected, and are for the most part typical in appearance, and faithfully reproduced with what elegance can at the same time and under these circumstances be displayed. The illustrations are made more valuable by the co-existence of a really thoroughly good manual of external diseases of the eye, between the pages of which the diagrams are interspersed, but to this we do not refer more particularly, partly because the letterpress, though very good so far as it goes, is meant to be subservient to the diagrams and supplementary to them, and partly because no manual written in a foreign language could be expected to take a place here among our own smaller text-books.

AMILCARE BIETTI (Rostock). Diplo-bacillus Conjunctivitis. *Annali di Ottalmologia, Pavia, xxvii.*, 2, 1899.

It is now some two years since Morax first succeeded in demonstrating clinically and bacteriologically the existence of a form of chronic conjunctivitis caused by the diplo-bacillus. Axenfeld also had just about the same time made a similar observation, and had recognised the same microbe; Peters and Gifford had also seen the organism, but had not recognised its pathogenic character.

This peculiar diplo-bacillary conjunctivitis is fairly frequent in South Germany, and is probably far from rare in Italy; its form differs but little from that known as angular conjunctivitis. Bietti explains the comparatively long delay in the isolation of the particular microbe by the fact that most of those ophthalmologists who have done much bacteriological work in connection with conjunctivitis have devoted their attention too exclusively to the acute forms, and also that this organism is not readily cultivated on the ordinary culture media unless blood serum or ascitic fluid be added. He, however, has been able to discover the microbe in all but eight of the forty-two cases of blepharo-conjunctivitis affecting the commissure of the lids in which he had searched for it. He considers, however, that it is not to be found in all the cases in which angular conjunctivitis is present; examination fails to demonstrate it in the cases in which the inner canthus alone is affected. Unless both commissures are affected the disease is not diplo-bacillary conjunctivitis, nor does a mere hyperæmia of this part constitute the disease. He has examined, with a negative result in all but two instances, a number of cases of more acute inflammation of the conjunctiva, but by this he does not mean to imply that the form just spoken of solely and only is caused by this micro-organism, but the rarity of its occurrence under other circumstances goes to show that the type of conjunctivitis caused by this germ is one characterised by the three features of chronicity, angular situation, and scantiness of secretion. Bach, it may be stated, however, believes that abundant secretion is not unusual, but Bietti considers such a condition quite exceptional. There is always more secretion at night than through the day, and from the little masses to be found at the inner canthus it is not difficult to cultivate the diplo-bacillus. There is at the same time but little in the way of subjective symptoms—a little photophobia and a slight degree of uneasiness on using the eyes by artificial light. The redness at the internal canthus gradually fades off on the lid-borders, slightly affecting also the outer surfaces over a certain area, and causing an appearance of real eczema. When such a clinical picture is present it is well to examine the secretion at once, and if the diplo-bacillus is found, as it probably will be, the diagnosis is complete, when, if appropriate treatment is at once begun, all the complications at once disappear. The disease is apt to develop slowly, and has but little tendency to spontaneous recovery; complications are not common, though corneal ulceration is occasionally seen; rhinitis resembling the scrofulous type, but without fissures, is not infrequent, and the eczematous condition of the lids may lead to ectropion. Though by no means highly contagious, perhaps on account of the scantiness of the secretion, diplo-bacillary conjunctivitis shows a disposition to affect different members of a family, no doubt by direct infection. The diplo-bacillus stains readily enough with any of the aniline dyes, and according to Gram's method; under the microscope it shows a length of about 2 μ and a width of about 1 μ; with the exception of Gifford, all observers say it has no capsule. It appears to be not infrequently found in cultures along with the pseudo-diphtheritic bacillus. The microbe can be grown fairly readily on blood serum, especially human serum, but cultures made thus appear to lose their virulence, for Axenfeld was unable to reproduce the disease by infection of the conjunctival sac with a culture thus made. In Bietti's opinion no curative application is so efficient as chloride of zinc.

F. W. M. OHLEMANN (Minden). Ocular Therapeutics. *Translated and Edited by Charles A. Oliver (Philadelphia). London: H. Kimpton.*

Whether this little book is calculated to be of any very great practical value may be doubted. Its aim apparently is to give in an easily accessible form the prescriptions most in favour with various ophthalmic surgeons, chiefly, of course, those of Germany; and so far there is nothing to say against it—indeed, we can imagine that it might on an occasion be convenient enough to turn to it when the springs of one's own ingenuity had run dry. But it would surely have served the purpose just as well without the printing out of the whole formula for, let us say, an ointment of mercury, in Latin almost unequalled for bad grammar; it would have sufficed to intimate that in certain classes of cases Herr Dr. So-and-so employs perchloride or yellow oxide in certain proportions. The book is thus made five times larger than there is any reasonable need for by useless verbosity and repetition.

It is unsatisfactory, too, to be informed that mistura oleoso-balsamica, for instance, is very useful as an eye-wash, unless one is also instructed as to its constituents further than by saying in a footnote, "German Pharmacopœia." The editor has taken a great deal of trouble to indicate the corresponding value in ounces and grains of the metrical system of measures employed abroad alongside of every single prescription given. Indeed, he has not spared himself even when by doing so he might actually have benefited the reader; thus he gives a prescription from von Graefe, containing among other things extract of hyoscyamus 1gm. in 100 cc. of "aqua calcaria," and he states with a literalness, which is surely a little misplaced, that this is equal to gr. 15 in ℥iij., ʒj., ♏xlviij. Most people would have preferred that he had taken the easier plan of saying how many grains there were in ℥i. The book is divided into two portions, the first or General Part dealing with the various forms in which treatment is applied, and the various classes of drugs, while in the second or Special Part different diseases form the different headings, and for each the appropriate remedies are suggested. There is a very copious cross-reference index of drugs, of diseases, and of authors, which reflects credit upon the pains expended on its arrangement and carrying out. Among the names in the author index there are hardly any of British origin. We are well aware of the difficulty of translating from German into elegant English, but we do consider that more pains might well have been bestowed upon the composition: it detracts much from the pleasure which one has in the use of a book even of medical reference to find it offending against the laws of good grammar; we note also with disapproval the use of the new Philadelphia method of clipping adjectives, *e.g.*, "chemic agents." There are errors, too, in the letter-press which ought not to have escaped notice; thus on p. 219 we have a brief description of "Synechiæ Scintillans."

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

H. R. Swanzy, F.R.C.S.I., President, in the Chair.
Thursday, May 4, 1899.

Clinical Evening.

Tumours of Iris.—Mr. A. H. Thompson showed a microscopic section of a tumour from a case which had been shown at a previous meeting of the Society. The portion of iris containing the tumour was removed, and the patient now had V. $= \frac{6}{6}$ in the eye. The tumour was probably a spindle-celled sarcoma.

Mr. Treacher Collins showed a case in which the tumour occupied the upper inner part of the iris, and the lens was cataractous. The patient was a woman, aged 63, who had had a black spot in the eye since childhood. The piece of iris was removed and the cataract extracted at the same time. The growth consisted of large endothelial cells with sharply-defined nuclei. It resembled in structure pigmented moles of the skin, and was probably innocent.

Mr. John Griffith thought Mr. Thompson's case was a myoma from the rod-shaped character of the nuclei, and that Mr. Collins's case was a large round-celled sarcoma.

Unusual Form of Opacity of Cornea.—Mr. Treacher Collins showed an example of this condition. It was present in both eyes, but was more marked in the left. It had much the appearance of a broken cobweb stretched across the cornea; the lines were in the corneal substance. They were possibly the tracks of old blood vessels after interstitial keratitis, but they were very wide for blood vessels, and did not extend to the periphery of the cornea.

Mr. Juler thought they were tracks of old blood vessels; there was a suspicion of scarring of the angles of the mouth which he thought made previous interstitial keratitis probable.

Dr. Breuer thought they were the lines which were sometimes seen in the superficial punctate keratitis described by Fuchs.

Mr. Silcock suggested that they might be blocked lymphatic vessels which had resulted in bands of fibrous tissues.

Dr. Hill Griffith asked if the possibility of the lines being due to a vegetable fungus had been considered.

Vascular Formation in the Vitreous in Diabetes.—Mr. Arnold Lawson showed a patient who had been known to be diabetic three years; his sight had failed two years in the right eye and six months in the left. The right lens was opaque; in the left eye there was at first a vitreous haze which obscured the details of the fundus. As this cleared there was found a connective-tissue formation consisting of feathery tufts proceeding from a central stalk, richly supplied with blood vessels.

Sloughing of Cornea rapidly following on Fracture of the Base of the Skull.—Dr. Lediard showed a man, aged 38, who had been knocked down by an engine. When first seen he was semi-comatose; he had right facial paralysis, the eye remaining open, severe scalp wounds, and the escape of cerebro-spinal fluid from the ear; the fifth nerve was uninjured. Notwithstanding the care that was taken of him his cornea sloughed, and the eye had to be excised. The probable reason for the sloughing was the exposure of the cornea consequent on the facial paralysis, and the condition of semi-insensibility induced in the cornea by the partial coma.

Primary Carcinoma of Eyeball. — Mr. Simeon Snell (Sheffield) showed this specimen. The patient was a man aged 69. There was a history of an injury to the eye (cornea) fourteen years before. When first seen almost the whole of the cornea was involved in a nodulated, hard, irregular growth. Careful examination failed to disclose any growth elsewhere in the body. The eyeball was enucleated, the orbit cleared out, and chloride of zinc paste applied to the socket. The growth had perforated the globe posteriorly. Mr. Treacher Collins kindly examined the eyeball, and reported that the appearances of the growth were typically those of carcinoma, and that it originated within the globe, but in which structure it was impossible to say.

Mr. Collins said that it was formerly the opinion that growths primarily occurring in the eye were sarcomata or gliomata, but it was known now that carcinomata occurred starting from the tubular glands of the ciliary body; they might also start in the pigment epithelium of the iris and choroid; he thought Mr. Snell's case probably originated in the ciliary body.

Mr. Silcock had seen orbital tumours having a structure similar to the one in question; possibly these might be endotheliomata and not epitheliomata.

Mr. Bronner remarked that as visceral carcinoma might exist for a long time without revealing itself, one ought to be cautious in accepting a carcinoma in the eye as a primary growth.

Mr. Jessop asked whether there had been any recurrence.

Carcinoma of the Eye Secondary to that of the Lung.—Mr. John Rowan showed a specimen of scirrhous cancer occupying the lower part of the fundus, and detaching the retina; its origin was in the glands or mucous membrane of the bronchi, the primary and secondary growths were similar in character.

Traumatic Ptosis.—Mr. Snell showed a stereoscopic photograph of a case of traumatic ptosis.

Piece of Glass localised in the Eye by means of the Roentgen Rays.—Mr. Mackenzie Davidson showed this specimen. A fragment of a Florence flask, during a chemical experiment, went into the patient's eye. It was shown by the *X* rays quite clearly, but was less dense than metal in appearance. The only modification of method used in this case was that the rays were passed obliquely through the eye, so as to avoid bone as much as possible.

Eyeball with Fragment of Steel lodged in its Coats.—Mr. George Mackay showed this specimen with skiagraphs. A traumatic cataract had been formed, which was removed, leaving the media clear. The position of the foreign body could be seen by the ophthalmoscope. As it appeared to be encapsuled it was not interfered with; after an interval of quiescence the vision failed, and the eye became irritable; the iris had a tawny-brown colour. Attempts to remove the foreign body by the magnet failed. After enucleation it was found fastened to the coats of the eye. In order to trace the parts of the eye discoloured by the rust of the iron Prussian Blue was formed with it; the corneal epithelium and the filtration angle were the parts most widely stained. Descemet's membrane escaped.

Solid Œdema of the Eyelids.—Mr. Anderson Critchett showed a case. The patient had erysipelas in 1894, followed by another attack later. Fulness of the lids followed; they were treated by pressure, puncture, and incision, without benefit; the mass had been excised by Mr. Higgins, but had recurred.

Mr. Eyre had photographed the same case five years before. At that time the upper lids were more swollen than the lower. He had seen seven similar cases, all of them after erysipelas.

Messrs. Frost, Silcock, and Mackay spoke of cases.

Artificial Eyes.—Mr. Critchett also showed samples of Snellen's artificial eyes.

Filamentary Keratitis.—Mr. Rayner Batten showed a woman, aged 29, who had had chronic conjunctivitis one year. A number of threads were seen hanging from the surface of the cornea near its edge; they were about 1 mm. long, and consisted of a twisted rope of epithelium. No vesicles were seen. They were symmetrical in the two eyes.

Orbital Tumour.—Mr. Juler showed a case. There was a history of proptosis two months. A fluctuating tumour was felt at the upper inner margin of the right orbit, dark blood escaped on tapping it; he thought it was a vascular sarcoma.

Mr. Lawford asked if the nose had been explored, as the case might possibly be a distended ethmoidal cell.

Mr. Lang had met with a similar case consisting of broken-down nævoid tissue.

OPHTHALMOLOGICAL SOCIETY OF PARIS.

MARCH MEETING.

Recueil d'Ophtalmologie, March, 1899.

M. CHEVALLEREAU showed a patient with sarcoma of the choroid situated close to the papilla. Though Chevallereau does not attach any importance, as a rule, to a history of injury as leading to the development of sarcoma, he admitted that in this case there was a trauma; the patient had had a fall from his horse in June, 1896; he had lighted on his chin so heavily as to lose consciousness, after which he was in hospital nearly six weeks. It was immediately after this that he noticed the vision of the right eye to be affected, and on examination it was found to be almost blind, the pupil not reacting to light. The tension was, if altered at all, faintly reduced, and with the ophthalmoscope a rounded globular tumour was seen completely covering the disc from view; its diameter was approximately 5 mm. The retina overlying this was normal in aspect and quite transparent, while through it could be seen a number of large vessels in the detaching mass, with some small hæmorrhages on its surface. Though closely adherent to the mass over the most part of its area, the retina seemed slightly detached at the lower and outer portions of the tumour. Central vision was completely lost, but peripherally the patient could count fingers. The other eye was normal, and there were no signs of any general infection, but as to the correctness of the diagnosis Chevallereau entertained no doubts.

M. ANTONELLI suggested the possibility of the appearances being due to a cysticercus.

M. GORECKI was not prepared to deny the influence of traumatism in determining the occurrence of tumours.

M. PETIT read a paper upon a peculiar form of serpiginous corneal infection; for an account of this see p. 159. M. Gorecki's experience of those cases in which there was no pain, although the cornea had not lost sensibility, was that if the pupil could be dilated they did well under liquor chlori; he considered that one function of the aqueous humour was to dissolve and carry away toxines; he disapproved of the use of either sulphate of zinc or nitrate of silver.

M. BOUCHERON remarked that it had often been noted that pus from a hypopyon was sterile, and asked whether the microbe of this keratitis could be grown in it; it had been said that the aqueous humour was not antiseptic, and neither was it in the strict sense of the word, yet it was quite certain at the same time that it was a medium very unfavourable for the growth of microbes; Ranvier believed that it was, unlike other serous fluids, destructive to leucocytes.

M. MORAX, who had worked along with the author of the paper at this subject, emphasised the fact that painlessness was only one of the *ensemble* of symptoms; he pointed out, too, that sulphate of zinc, which was so useful in this type, was of great efficacy also in the corneal lesions which sometimes accompany subacute or diplobacillary conjunctivitis. It was quite true that pus in the anterior chamber was sterile; Uhthoff and Axenfeld had found it so in cases of serpiginous ulcer caused by pneumococcus, except when perforation had occurred. He did not, however, himself believe that the aqueous humour had any bactericidal power, for hypopyon could be caused by the application to the cornea of pure toxins, so that penetration of the cornea by the microbe was by no means necessary; in cases of hypopyon caused by streptococcus, however, it was common to find that organism in the pus. If, then, the aqueous humour has any antiseptic power at all, it must be admitted to be ineffective against the streptococcus.

NOTE ON THE METHODS OF ADVANCING THE RECTI MUSCLES OF THE EYEBALL.[1]

BY J. B. STORY.

SURGEON TO THE ROYAL VICTORIA EYE AND EAR HOSPITAL, DUBLIN; PROFESSOR OF OPHTHALMIC AND AURAL SURGERY, ROYAL COLLEGE OF SURGEONS IN IRELAND.

ON giving notice to the Secretary of the subject of this communication I thought I would have a complete novelty to bring before you this evening. But—alas for the uncertainty of human hopes!—the operation which I have been cherishing for more than three years as my peculiar property has been already described by no less than two oculists, one in France and one in Germany. The second of these in order of time is Dr. E. Praun, of Darmstadt, whose paper appeared in the *Centralblatt für praktishe Augenheilkunde* in September, 1898.

When I read his paper I felt that I had lost an opportunity of enlightening the Ophthalmological world that would never return, and for more than a month I regarded Dr. Praun with mingled feelings of admiration and envy. But at the end of the month a note appeared in an Ophthalmological periodical, which informed me and also Dr. Praun that the operation had been described by Dr. E. Valude in the *Annales d'Oculistique* so long back as August, 1896; so that priority belongs neither to me nor Praun, though probably in his case, as certainly in mine, the operation was devised quite independently of Dr. Valude's publication.

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[1] Read at Academy of Medicine in Ireland, April 7, 1899.

For my part, I was doing the operation so long ago as March, 1896, as the routine method, and have been for more than three years demonstrating it to the students at St. Mark's as my own, until the appearance of Dr. Praun's paper, above mentioned, called my attention to Valude's publication in the *Annales d'Oculistique* of August, 1896.

Before describing the operation which I have devised I may perhaps mention briefly some of the various methods which have been proposed and practised for advancing the recti muscles since V. Graefe first originated a definite, though imperfect, method for effecting the object in view. One of the most ingenious is that of Weber. This is the method I learnt as a student at Zürich from the late Professor Horner, and practised during the earlier part of my professional life. In it three needles are used and one suture. The suture, doubled, is passed through the first needle, and the two free ends are threaded through the other two needles. The first needle then is passed through the tendon from the scleral aspect, and passed through Tenon's capsule and conjunctiva also. It is then taken off the suture, which leaves a loop of suture projecting from the external surface. The other two needles are then passed under the conjunctiva to the upper and lower borders of the cornea respectively. Each of them is then passed through the before-mentioned loop (of course from opposite sides), and by tying them together the tendon is drawn forward till it lies as close to the border of the cornea as is thought necessary. This operation has lately been described by an oculist in the antipodes as a new operation. It may be new in the antipodes, but is old in Europe. It is an operation which often produces brilliant results, but occasionally fails, and it was these occasional failures which induced me to give it up. The failures are, I believe, due to the difficulty of obtaining firm union between the end of the tendon and the eyeball, which difficulty is, I fancy, caused by the fact that the suture does not closely unite the tendon to anything at all. The end of the tendon may be pressed closely to the actual border of the cornea, but the sutures which hold it in this position are attached to a portion of conjunctiva, removed some distance from the border of the cornea to which the tendon is pressed.

The operation is, I think, superior to the ordinary method as described in Mr. Swanzy's admirable text-book, and which I take to be the modern type of Critchett's operation. In it a suture is knotted round each side of the tendon, and then each suture is passed up under the conjunctiva to the upper and lower border of the cornea respectively, and then securely tied. I have frequently done this operation, and usually found great difficulty in removing the sutures. The operation has no points of superiority to Weber's, and has one very great defect from which Weber's is free, viz., if one suture gives way before the other the globe is rotated round its antero-posterior axis, and a satisfactory cure of the squint is not obtained. It was, however, when knotting the sutures round the tendon in this operation that the idea occurred to me of splitting the tendon longitudinally, and in my earlier operations I used to knot the sutures regularly in this way.

This knotting of the two sutures round the tendon has also, I see, been the means of suggesting to Dr. Valude the methodical splitting of the tendon as part of the operation. He states that he observed in doing the usual operation that a good result only followed when the tendon was accidentally split longitudinally by the pull of the sutures, and he therefore conceived the idea of making the division of the tendon a regular part of the operation.

Schweigger's operation is rather a shortening of the muscle than an advancement of the insertion. He exsects a piece of the tendon or muscle, and sutures the proximal end to the original insertion. I have done this operation frequently, and though it has been a brilliant success in some cases, I have not found it nearly as satisfactory as the method of splitting the tendon. In the latter the muscle is really advanced and encircles a larger portion of the globe, and thereby a much greater effect is produced than by merely shortening the muscle and attaching it to its old insertion.

Many operators fix the sutures into the sclerotica, as the conjunctiva affords such a fragile tissue for the attachment of sutures, but since I have adopted the device of splitting the tendon and using glass beads, I have found the sutures holding perfectly in the conjunctiva alone, though, of course, if it is wished, they can be passed also into the sclerotica.

Prince, in the operation he describes as the pulley operation, passes the pulley suture into the sclerotica. His is another of the operations I have tried, and discarded in favour of the operation I shall now describe.

The usual conjunctival incision is made tangentially to the corneal periphery, and the tendon is exposed in the usual way, and fixed by means of Prince's forceps. It is then separated from its scleral attachment. Two doubly-armed sutures are used. The needle at one end of a suture is passed through the tendon from its external aspect as close to the edge of the tendon as possible. The needle at the opposite end of this suture is passed also from the external surface, pretty close to the centre of the tendon. Half of the tendon is thus caught in a sort of loop. The other half is then engaged in a precisely similar loop. An assistant then pulls on the two needles of one of these loops, while the operator pulls on the needles of the other loop, and divides the tendon longitudinally by a snip of the scissors. The two needles of each loop are then passed under the conjunctiva, and brought out as close to the ends of the vertical diameter of the cornea as the conditions of the case require, a short distance intervening between the points of exit of the two needles of the same loop, and then the ends of each loop are firmly knotted together over a small glass bead. The glass bead serves to prevent the sutures cutting through the conjunctiva, and also enables the suture to be removed more easily after union of the tendon has been obtained.

From the description it may seem that the operation must be a tedious one, but I find it quite as rapid in performance as any other method which I have tried, and I believe I have tried nearly all that have been published.

The advantages of this particular method are :—(1) The tendon is closely united by a firm knot to the actual spot to which it is desired that it shall adhere, and not connected by a longer or shorter band of suture to a point some distance from the spot to which it is to adhere ; (2) The muscle is really advanced, and by encircling a larger portion of the circumference of the globe obtains a greater power of rotation than it can get in Schweigger's operation, for instance ; (3) The way in which the sutures are inserted in the tendon makes the strain on them to be at right angles to the direction of the fibres, and thus avoids the necessity of knotting the sutures in the tendon before attaching them to the globe, as has to be done in several of the other methods ; (4) The splitting of the tendon allows a perfectly symmetrical advancement of the muscle to be made, so that the muscular force will act in the same plane as before the operation, and not produce any rotation round the antero-posterior axis of the globe. This perfectly symmetrical advancement is difficult to obtain in many of the other methods. In this there is no difficulty whatsoever. (5) The broad, or rather the long contact of the split tendon, with the globe, affords a better prospect of union between them than is offered in most of the other methods; (6) The use of the glass beads keeps the sutures from cutting through the tissues, and enables the operator to remove them easily when union has been obtained; (7) There is no disfigurement produced by puckering or swelling of the conjunctiva, which is not infrequent in many other operations.

It is unnecessary to state that a piece of tendon may be excised in this operation if the conditions of the case require it.

It is not, in my opinion, possible to lay down general rules on the indications for advancement of the recti muscles, but I may briefly mention what my usual practice is:—When the squinting eye is more or less amblyopic, and the angle of squint more than 20 degrees, I usually perform a tenotomy of the antagonist, with an advancement of the defective muscle, but if the visual acuity of the two eyes is nearly equal I mostly tenotomise the two internal recti. This refers to convergent strabismus. In internal strabismus, again, of 30 degrees and upwards I usually tenotomise both internal recti, and advance the external rectus of the squinting eye, if necessary exsecting a portion of the tendon as well. In external strabismus above 20 degrees I usually perform an advancement in addition to tenotomy of both external recti, and in case of amblyopia of one eye in external strabismus I nearly always do advancement with tenotomy of one or both external recti.

A SIMPLE DEMONSTRATION OF THE FOCUSING OF RAYS IN ASTIGMATISM.

By A. Freeland Fergus, M.D., Glasgow.

Students who are beginning their ophthalmic studies have often a difficulty in understanding the fact that the refraction of the vertical vessels seen in the fundus is determined by the horizontal curvature of the cornea, and, on the other hand, that the refraction of the horizontal vessels depends on the vertical curvature of the cornea. The following demonstration is one which I have employed for a number of years :—

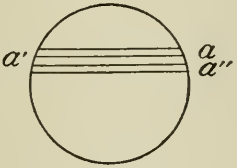

Fig. 1.

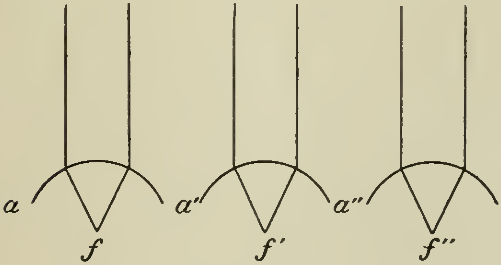

Fig. 2.

Let figure 1 represent a cornea, and let three very narrow strips of it, *a a' a''* be taken, the refraction of parallel light through each of these strips is roughly represented in figure No. 2.

The light incident on the strip *a* is brought to a focus at the point f; that incident on the strip a' at f'; and that incident on the strip a'' at the point f''.

Now, if the curvature of each strip is the same, which for three very narrow contiguous corneal strips it is, and if the index of refraction of the media is the same, which is true for the case under consideration, then the distance between a strip and the focal point is the same in each case.

Let us now rebuild the cornea by placing the corneal section a' on the top of a; then f' will be exactly on f, and if a'' be applied to a' we have f'' exactly on the top of f'.

Thus on rebuilding the cornea in horizontal sections we find that their united focal points trace out a line which must lie vertically. A model can easily be constructed to illustrate this fact to students.

S. KLEIN (Vienna). Isolated Unilateral Traumatic Paralysis of the Superior Oblique. *Wiener Klinische Wochenschrift*, 12, 1899.

Isolated paralysis of the superior oblique is of course far from being uncommon, and is most frequently supposed to be peripheral, that is, orbital in origin, though it is more than likely that, if many of the cases of this nature were carefully followed up, it would be found that they did not continue to be limited to one muscle, and that other symptoms arose pointing with greater or less certainty to a more central cause. While central or intra-cranial paralysis of this muscle is common enough in association with other muscles, isolated intra-cranial paralysis is much rarer, though it has occurred even traumatically. The case of the lesion indicated in the title is, however, in Klein's opinion unique, which is his excuse for its publication.

A sharp, intelligent girl of 10 complained that for two days she had been seeing double; it appeared that she had fallen on a slide striking the back of her head severely a couple of days before presenting herself, but beyond a little bruise on the head she was not supposed to be hurt. She proceeded to school, and it was when at work there that she noticed diplopia; by the time she left school that day she required to be led, so distressing to her was the double vision. Her friends were naturally much alarmed, and she was put to bed and cold applied to the head; but she had no other symptom, there was no headache, vomiting, or loss of appetite, and she went back to school next day, though still annoyed by persistent diplopia. On examination it was evident that there was paralysis of the left superior oblique, but no affection of any other ocular muscle; otherwise the child was in perfect health, and ophthalmoscopic examination showed a normal fundus. What, then, was the precise cause of the paralysis? In the first place, there can be little doubt of the accuracy of the statements as to the onset of the double vision; it must be accepted that this came on as the direct and immediate result of the injury. It is difficult to suppose that the lesion can have been basal, else surely some other muscle would have been implicated; and it is not probable that an actual fracture of the base could have produced absolutely no head symptoms and no hæmorrhage from the ear or elsewhere. In Klein's opinion a nuclear lesion is the best explanation, such as indeed is known to occur as the consequence of a severe blow on the occiput. The lesion, then, probably lay at the floor of the aqueduct of Sylvius. It is not probable that any damage other than a hæmorrhage could in this situation produce a "discharge" so perfectly limited, any other would have been more sure to cause more general symptoms as well. For example, laceration of the cerebral tissue, caused by the concussion, one can hardly accept as probable, for the area of the lesion in the iter must in the case under consideration have been so extremely limited. In this connection it is worthy of special note that in this case polyuria was not present—a feature which is particularly marked in certain instances similar in some respects. As regards prognosis, Klein expresses himself somewhat hopefully, but is careful to say that a good result can be looked for only if the nerve cells have not been too much damaged by the lesion; besides which there is an old saying, according to him, that long standing cases of paralysis of a muscle are apt to pass into concomitant strabismus. If this be so, one would come to regard in a different light those supposed causes of strabismus which bulk so largely in the public mind, such as injuries and violent cough. That this old saying is sometimes true we have seen evidence ere now, but whether it is so with any frequency sufficient to affect one's attitude towards strabismus and its causes is questionable. Putting this debatable matter aside, Klein's case is a very curious and interesting record.

PANEGROSSI. The Oculo-motor Centres in Man.

Revue Générale d'Ophtalmologie, iv., 1899.

This paper was published in the records of the laboratory of human anatomy of the University of Rome; its conclusions, as indicated in the French review, are too valuable to be passed by. In regard to the nerve to the external rectus, Panegrossi says that the superficial arciform fibres are clearly in contiguity with the nucleus of the sixth pair, but the cortical motor area, its route of connection, and the precise relation to the occipital lobe, are unknown. It is still doubtful whether the posterior longitudinal bundle is or is not connected with the nuclei of the third nerve; the hypothesis of those who would have us recognise in that strand a mode of union between the nucleus of one sixth and that of the opposite third is not to be accepted. It is debatable whether the accessory nucleus of the sixth, as it is called, belongs to this nerve or to the facial.

We are to consider as the nucleus of the fourth nerve that group which lies in the bend executed by the posterior longitudinal bundle; the cell groups of Westphal and of Böttiger do not belong to the fourth pair. The nucleus of the fourth appears distinctly only in the more anterior sections; distally it is represented by a small group of cells lodged in the slight bend or curve in the course of the posterior longitudinal bundle; this group of cells is very variable both as regards situation and dimensions, and very often it appears interrupted along the longitudinal axis. No anatomical proof has been furnished of the existence either of direct or of doubly crossing fibres from the nerve to the superior oblique, the inference being that the fibres of the fourth cross once, like those of other nerves. The nuclei of the fourth and third are in direct continuity with one another.

As regards the third nerve, the scheme of nuclei given by Perlia sums up pretty well our knowledge in the matter, though certain of the details require a little filling in. The partial crossing of certain of the fibres, especially those in the more posterior sections, can be demonstrated readily enough, and the middle fibres also, particularly those from the dorsal group of cells. A precise mapping out of the various nuclei in their relations to the individual muscles supplied by the third is beyond the powers of anatomy alone. The nucleus of Darkschewitsch is to be regarded as the nucleus of the posterior commissure, while those of Eding-Westphal and of anterior median situation do not appear to represent the intrinsic muscles of the eye; their relation to the extrinsic muscles, though probable, is not proved with any certainty as yet. From a number of facts it seems probable that the nucleus of the movements of the upper lid is in the anterior portion of the third nucleus; and may be liable to receive influences from the superior facial. It is probable also in Panegrossi's opinion that the centres for the internal recti are in the posterior portion of the dorsal nucleus, and if so the fibres proceeding from them will be crossed. It is likely, too, that the inferior oblique may be innervated from the same nucleus as the internal rectus; it is in the anterior portion of the principal nucleus that he thinks the centres for the superior and inferior recti may be found. The fibres which in this situation are seen running in the middle line have in all likelihood no concern with the third nerve.

YARR. Trachoma among various Races. *British Medical Journal, May* 6, 1899.

In an interesting article Yarr reviews the information we possess upon the questions of racial and local distribution of trachoma. In respect of this disease he divides the human race into three classes, those, namely, who are receptive, those relatively immune, and those absolutely immune. In the first of these classes may be placed Jews, Poles, Italians and Irish among the white races; the inhabitants of Egypt, Persia and India are also included in this class; but of all races the Chinese and Japanese enjoy the unenviable distinction of being the chief sufferers. Various observers have found that trachoma accounts for 78 per cent. of all eye diseases in South China and for 75 per cent. in Japan. To this class he might have added the inhabitants of certain non-Polish districts of Russia.

In the second or relative immunity class pure-blooded negroes find a place; in regard to this point the experience of the practitioners of Cuba is interesting. The inhabitants there consist of three races—the whites, the negroes (not pure blooded), and the Chinese; for one negro attacked there are four whites and seven Chinese, affected, even after all allowance has been made for the variations in actual numbers of the different nationalities. Van Millingen denies this supposed immunity of the negro on the ground that he has seen a considerable number suffering from trachoma in Constantinople, but it must be remembered that the negro of Turkish lands is of very mixed and impure race, largely intermingled, coming as he does from North Africa with Semitic blood, which, as is well known, is highly susceptible to trachoma. The Cingalese are reported to be relatively immune, but more information is wanted upon this head.

In the group of those absolutely immune are to be placed the Indians and Esquimaux of Canada, according to the evidence of nearly all the ophthalmic surgeons of note in the Dominion. This is the more noteworthy because in many instances these people live under the most unwholesome conditions, huddled together without any reference to the number of cubic feet per head, liable to outbreaks of severe epidemics, many of them tuberculous, many more syphilitic, unclean to a fearful degree, and exposed to every disease under the sun, but amid it all exempt from trachoma. The Indians of the United States, it appears, do not belong to the same race as those under British protection, and are by no means free from trachoma.

It is to be noted further that these various nations carry with them to other climes than their own their immunity or liability as the case may be. Thus the ubiquitous Chinaman, Irishman, or Jew, seems to be in more danger of trachoma than is the nation in whose land he happens to dwell. This is particularly illustrated — to take one instance—in certain parts of the United States, where Chinese and negroes live side by side under similar conditions, yet trachoma attacks them to a very different degree. Whether the Canadian Indian carries his immunity with him to the States and elsewhere is not quite certain as yet. Chibret holds the opinion that altitude has much to do with the question, and that at high altitudes trachoma does not occur, but climatic conditions alone have not an overmastering effect ; given other suitable conditions, a high altitude alone will not protect. Yarr points out that, whereas in the mountainous regions of Persia and other countries where intense heat, dryness, and dust are combined, there is grave liability, in the Alps where the air no doubt is rare, but is at the same time moist and cool, there is very little trachoma.

He regards filth, overcrowding and starvation as factors in increasing racial receptivity, probably chiefly by lowering the resisting power; but not as sufficient in themselves to make the disease common unless there is also this peculiar racial liability. Whether trachoma is or is not truly contagious the author does not discuss.

ARONIS (Smyrna). Extirpation of the Lacrimal Sac. *Annales d'Oculistique, March*, 1899.

C. R. HOLMES (Cincinnati). Extirpation of the Lacrimal Sac and Gland. *Archives of Ophthalmology, vol. xxviii., p.* 1, *January*, 1899.

J. B. LAWFORD. Notes on the Treatment of Chronic Dacryosystitis by Extirpation of the Lacrimal Sac. *St. Thomas' Hospital Reports, vol. xxvi.*

THE difficulty of effecting a cure in a certain proportion of the cases of chronic catarrh of the lacrimal sac is well known, and these three papers are interesting as giving the views of the writers and the results obtained by them in dealing with this troublesome condition.

That conservative measures should always be tried, if possible, in the first instance, they all agree; and Holmes lays stress on the important point that the primary treatment should be of the gentlest possible nature.

Unfortunately conservative treatment is unsuccessful or impracticable in a certain number of instances, and more radical measures must be resorted to if the symptoms are to be alleviated.

The courses open to us are (α) obliteration of the sac by cauterisation; (β) extirpation of the sac by dissection with or without removal of the lacrimal glands. Obliteration of the sac by cauterisation, the authors agree, is uncertain in its result, and if a second operation becomes necessary, some disfigurement is likely to occur.

Neither Aronis nor Lawford discusses the question of removal of the gland, though the latter mentions that the epiphora, which is so troublesome a symptom, is greatly relieved, and in some cases entirely cured by extirpation of the sac alone. Holmes, on the other hand, states that "an operation which only obliterates the canal without cutting off the annoying supply of tears, which torments the patient for the rest of his life, is a very incomplete piece of surgery." In some of his cases, where only the sac was extirpated, epiphora still gave trouble, but was at once and permanently relieved by removal of the gland. The patient experienced no inconvenience from the loss of the gland, and he reports that the eyes did not suffer in any way—though, of course, weeping was not accompanied with tears when the gland had been removed.

The circumstances under which these authors recommend extirpation of the sac are as follows:—(It should be mentioned that Aronis quotes the indications given by Kuhnt.)

(1) When conservative treatment has been tried carefully and regularly, but has failed to cure in reasonable time (Holmes, Kuhnt, Lawford).

(2) When the patient is unable to endure the treatment, or cannot devote the time to it (Holmes, Kuhnt, Lawford).

(3) When there is an impassable stricture, either bony or fibrous, or when there is congenital absence of the duct (Lawford).

(4) When immediate operation on the eyeball is necessary (Holmes and Kuhnt).

(5) When serpiginous ulceration of the cornea is present (Kuhnt).

(6) When the sac is involved in cases of trachoma and has become contracted, yielding a small quantity of viscid secretion (Kuhnt).

(7) In cases of caries of the lacrimal bone or frontal process (Kuhnt).

Operation.—There is no doubt that the extirpation of the sac in its entirety needs great care, and the difficulties of the operation are greatly increased by the free hæmorrhage which occurs from the surrounding tissues. The writers agree that the sac should *not* be incised before the dissection is practically completed, as the chances of removing it whole are lessened if the sac is opened.

To localise the exact position of the sac a strabismus hook may be passed into it along the lower canaliculus (Lawford). Holmes and Lawford make an oblique incision in the skin *over the sac*, commencing either on a level with or just above (Lawford), or just below (Holmes the tendo oculi. Lawford, having exposed the sac, first separates it from the bone on the inner side, and having freed the lateral attachments, he cuts through the lower end at its junction with the nasal duct, and finally dissects out the upper extremity. Holmes uses a blunt hook, made for the purpose, which he passes round the sac, to help him in his dissection. He also uses the hook to draw down the upper end of the sac from beneath the tendo oculi. He does not think it necessary, as a rule, to divide the ligament. Aronis recommends and describes a somewhat different operation devised by Kuhnt, which he considers to be an infallible means of removing the sac *in toto*. It is as follows:—The assistant draws the skin tightly towards the bridge of the nose, and the operator, standing behind the patient, presses his left thumb-nail on to the crista lacrimalis anterior and cuts down to the periosteum close to his nail. The incision is 2·5 cm. in length and extends from 4 mm. above the internal palpebral ligament to 5 mm. below the commencement of the nasal duct. If the ligament escapes the knife, it may be cut through with scissors. The temporal lip of the wound is drawn outwards, and the fibrous capsule of the sac is divided for the whole length of the crista, taking care not to injure the sac. He states that the bluish colour of the anterior surface of the sac is readily distinguished. The *internal surface* of the sac is first separated from the periosteum by means of blunt-pointed scissors;

the *upper end* of the sac is then seized in the forceps *in its fibrous capsule*, and is freed with short snips with the scissors held vertically and cutting above, and a little outwards. *The posterior surface* is next separated, and lastly the *external surface.* To complete the operation the sac is cut through at the commencement of the nasal duct. Aronis considers that the two most important points in the operation are (α) the primary incision on to the crista lacrimalis, and (β) the seizing of the top of the sac in its fibrous capsule.

Holmes and Kuhnt curette the mucous membrane of the nasal duct, and the former slits the canaliculi throughout their whole length and destroys the mucous membrane with the cautery. Sutures are inserted, and healing by first intention is to be aimed at.

Holmes proceeds to removal of the lacrimal gland, and in his paper gives a description of the operation. The results of this treatment in the hands of the three surgeons have been very satisfactory, as the records of their cases show.

W. T. Lister.

A. TERSON. Ophthalmological Methods. *Technique Ophtalmologique. Paris: Baillière et Fils*, 1898.

The author gives here in book form the substance of a course of lectures and demonstrations on ophthalmic surgery which he has delivered to the students of M. Panas' Clinique, at the Hôtel-Dieu, in Paris. He divides his subject into three parts: anæsthesia, antisepsis, and instrumental methods. Although occasionally dogmatic and with strongly-marked individual likings, he tries—generally with success—to be impartial. While both the chapter on anæsthesia and that on antisepsis are somewhat lengthy, the historical references might with advantage have been more plentiful.

The author's views will often appear somewhat unfamiliar to readers in this country. For instance, he says that one will never undertake to chloroform a patient without having at hand a tongue forceps with one sharp (bent) point. "An accident," he says, "will rarely occur if, with every patient whose breathing becomes difficult, one does not hesitate to apply the sharp tongue forceps. The small wound is not bigger than a simple bite, and the patient when awakening believes in a bite, an illusion which it is often well not to disturb."

Nor will the summary way in which the question of ether *versus* chloroform is disposed of be accepted without demur on this side of the Channel: "Anæsthesia by ether will not be employed at all."

For local anæsthesia a cocaine solution of 2½ per cent. seems rather strong as the "weak" solution; we have generally found a 1 per cent. solution quite strong enough. The use of the extract of the suprarenal capsule, instilled three times at intervals of two to three minutes, is highly recommended for the purpose of reducing any congestion of the anterior part of the eyeball, and rendering an inflamed eye more amenable to the anæsthetic effects of cocaine.

Subconjunctival injections of three to four drops of a 1 per cent. solution of cocaine are greatly praised for their "marvellous" effect for tenotomy. It seems to us, however, that simple instillations are perfectly efficient and preferable for more than one reason. Glycerinated and oily solutions are both recommended highly; for the former the advantage is claimed that they can be more easily sterilised, and that they are easily miscible with the tears and with water, though they sometimes irritate, while the oily solutions are hostile to the life of bacteria. It must not be forgotten to use for oily solutions the base itself and not the salts. Both glycerinated and oily solutions are said to be less deleterious to the epithelium than aqueous solutions.

The extract of the suprarenal capsule is said to have been used to good advantage by Dor and by the author for the treatment of vascular keratitis, anterior sclero-choroiditis, iritis, and other affections of the anterior part of the eyeball.

In the beginning of the second part, on Antisepsis, an interesting historical remark is found about sympathetic ophthalmia: " It may be permitted here," says the author, " to recall that Fabricius ab Acquapendente declares that an operation for couching did produce such an inflammation that the other eye was lost from *sympathetic inflammation*. Couching, therefore, occasioned the first mentioning of sympathetic ophthalmia, the discovery of which is generally attributed to much more recent authors."

For local antisepsis the author prefers the biniodide of mercury to all other drugs, and uses Panas' formula (biniodide of mercury 0,05, alcohol 16, water 1000) for irrigations before and during operations, and asserts that the alcohol does not produce any irritation. For the palpebral margin an oily solution of biniodide (4:1000) is used, which is applied the evening before the day of operation, after the palpebral margin has been cleaned with sterilised cotton and a 2 per cent. solution of carbonate of soda.

The author has figured a drop bottle which he has designed (fig. 10, p. 110) for the purpose of keeping the ordinary drop solutions in an aseptic state, but it seems to us that the excellent Stroschein bottles are preferable and might have been mentioned.

For sutures of the conjunctiva, but still more so for the skin of the lids, horsehair and silkworm gut should not have been forgotten.

The treatment of purulent conjuctivitis by continued irrigation of the conjunctival sac has no doubt given good results, but we think protargol ought not to have been omitted in enumerating the various means of treatment, as its application is as simple as its effects are unsurpassed.

We do not think the author's attack on the practice of mounting two instruments on the same handle quite justified. With a slight amount of care there is no need to infect the instrument on one end while using the other, and "this type of a detestable instrument" appears to us quite useful and suitable. But here, as so often, the individual liking of each operator plays a great part. We should ourselves feel greatly disinclined to use the fixation forceps with cross action (fig. 40). And while on the one hand the screw of Terson's blepharostat (fig. 35) appears to be a great improvement, the author's curved knife (fig 54) has scarcely anything to recommend it, and seems to be, theoretically at any rate, a step back from Græfe's knife. The alleged great advantage, "that its curve prevents the edge and the back from being confounded, an accident that has happened to numerous operators with Græfe's knife," can hardly be taken seriously.

A list of instruments for the various operative procedures and a fairly complete instrumentarium are found at the end of the book and will prove useful for the student.

DESCHAMPS (Grenoble). Injuries of the Eye by Chestnut Thorns. *Annales d'Oculistique, April*, 1899.

Every autumn during the chestnut harvest Deschamps sees a few instances of punctured wound of the eye, and especially of the cornea, produced by the little prickles or spines on the husk of the fruit. When the time comes for gathering the chestnuts they are knocked down from the trees, it seems, by means of long poles, much as walnuts and some other fruits are dealt with. It may thus readily happen that when one is gazing up into the tree, manipulating his pole and searching for chestnuts among the foliage, a nut comes tumbling down, and strikes him on the open eye before he has time to guard it. The little prickles on the chestnut are extremely sharp, very fragile, and finer than the finest hair, so that an eye is frequently injured by several which are left sticking in the cornea or sclerotic, the points broken short off at the surface of the globe; Deschamps has seen as many as twelve in one eye. It sometimes is the case that the spine is sufficiently long to reach into the anterior chamber, and may touch the iris. Although these spicules do little actual direct harm to vision, because they are so minute, they produce intense photophobia, pain, and lachrymation; while so fine are they that to lay hold with fixation forceps and remove them is perfectly impossible. The recovery from the irritation may be rapid or prolonged, and acute abscess of the cornea with hypopyon may take place, and it is noteworthy that this may be in eyes hitherto perfectly sound and not affected with lachrymal obstruction, and in young and healthy individuals. He considers, therefore, that the infection of the wound must be primary and direct, not secondary; in short, that the spicule must itself be septic; in this particular there is a marked difference between this lesion and the ordinary "harvest ulcer" of the cornea, which rarely if ever becomes septic unless there be some lachrymal obstruction. Even among the chestnut injuries some, however, remain quiescent, they do not by any means all go on to suppuration, and the prickle may remain fixed in the eye, and yet the irritation pass off and the eye become quite free from reaction. Deschamps relates one instance of this by way of proof, in which a spicule could with certainty be known to have been sticking in the cornea for three months. For a few days at first it had caused the usual reaction, but had then quieted down and was accidently discovered in the pupillary area of the patient's cornea by his wife, and from this situation it was removed by the writer. The reason for the absence of severe reaction Deschamps thinks may have been the fact that the day on which the accident occurred was very wet, and it is possible that the rain may have washed off the injurious particles from the fruit at which the patient had been working. To contrast with this favourable case, Deschamps relates one of the opposite type, in which a patient presented himself the day after having received injury; five prickles had entered the cornea, and already each was surrounded by a zone of infiltration of yellowish colour. Pain was severe, the coats of the eye were much injected, and iritis was coming on; the lachrymal passages were healthy and pervious. Deschamps removed at once each of the five spines and very thoroughly applied to each infiltrated area the fine point of a galvano-cautery, but, in spite of his efforts, the ulcerative process advanced, the anterior chamber gave way, and eventually a leucoma formed so large that there was barely space to perform a small iridectomy.

It is extremely difficult, as has been mentioned above, to catch those exceedingly fine prickles in order to remove them; Deschamps uses a pair of forceps like cilia forceps, and sometimes a Bowman's needle; after their removal one can sometimes see the anterior chamber empty by the gradual draining away of the aqueous through the minute puncture which the prickle has made. This is not altogether a disadvantage, for the track is thus irrigated, and the danger of septic infection reduced; indeed, the author says he has repeatedly seen in one cornea several penetrating, and several non-penetrating, punctures, the former of which remained free from infection owing to the cleansing action of the aqueous humour, while the latter became septic. So confident is Deschamps of the benefit thus obtained that he considers it good practice in such cases to insert a tattooing needle into a non-perforating puncture, carry it into the anterior chamber, and rotate it about its axis, having first wetted it with an antiseptic solution; the track through the cornea is thus thoroughly cleansed and freshened, and the eye heals up.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

H. R. SWANZY, F.R.C.S.I., President, in the Chair.

JUNE 8, 1899.

Mr. Tatham Thompson showed a section of an eye with sub-conjunctival dislocation of the lens.

Mr. Juler exhibited a drawing of the fundus oculi showing peculiar changes round the optic disc following optic neuritis.

Mr. Holmes Spicer showed a case of spring catarrh in a boy, aged 10, of Jewish origin. The upper and lower lids were covered with large flabby granulations, the appearances being very similar to those of trachoma. On the other hand, there was a milky film over the conjunctiva of the lower lid, there was no scarring of the lids, though the boy had had attacks of inflammation in the eyes since 1896; the granulations were situated more on the tarsi than in the fornices, there was no pannus; the mildest treatment was much more successful than caustics, and the boy only suffered from inflammation of the eyes in the hot weather, and had no trouble in the winter months. There was also very slight thickening of the conjunctiva at the limbus above and below, slightly overlapping the clear cornea.

Mr. Juler thought there were some signs of scarring of the lids, and that the whitish film on the lower lid was due to suppuration. He believed that the case was one of chronic trachoma.

Mr. Treacher Collins said that the diagnosis would probably be cleared up if the white material were examined microscopically. In spring catarrh the white appearance was due to thickening of epithelium, whereas that due to granuloma was of the nature of a round-celled secretion.

Dr. C. E. Beevor and Mr. Marcus Gunn read a paper on a case of obliteration of a branch of the retinal artery following frequent attacks of temporary amblyopia. The patient, a man, aged 34 years, had suffered since childhood from temporary attacks of amblyopia lasting a few minutes, and involving especially the right eye, but unattended by headache. About nine months ago, after violent exercise, he had one of those attacks of blindness of the right eye, which was followed by loss of the superior half of the visual field of that eye; this condition had persisted as well as loss of part of the periphery of the lower half of that field. At present, on ophthalmoscopic examination, there was atrophy of the lower half of the right disc, with shrinking of the branches of the lower half of the arteria centralis retinæ. He had had occasional attacks affecting the left eye, and in one he temporarily lost the lower half of the field of vision of the left eye. There were no other symptoms except that the right knee-jerk was very deficient and very difficult to obtain. The pupils were equal and reacted to light and accommodation.

From the history and the absence of any cardiac disease, the case was considered to be an example of recurrent spasm of the arteria centralis, of which one branch failed to recover its normal condition.

His sister, who is subject to true migraine, has for the last six years had curious attacks of apparent receding of objects around her, the objects getting smaller and smaller and finally disappearing; after fifteen minutes she recovers completely. She is convinced that the symptoms are confined to the right eye—since if she closes this eye during the attack the peculiar symptom disappears.

Mr. J. B. Story reported two cases of recovery of sight after partial occlusion of the central artery. Case 1 was that of a man, aged about 35 years, in whom blindness came on suddenly in the left eye on Dec. 26, 1898, after great soreness in the eye the day before. He was first seen on Jan. 5, of this year. Externally the eye was normal in appearance, but the pupil did not act to light; vision was reduced to a perception of light. The optic disc was hazy, the arteries were threadlike, and there was a slight cherry colour at the macula, as is seen in typical cases of embolism. Inhalation of nitrite of amyl produced some redness of the fundus, and arterial and venous pulsation could be produced by pressure. The patient was apparently healthy and was not rheumatic; his heart was not examined. Iodide of potassium was ordered internally, with daily inhalations of amyl nitrite. After six days he could count fingers at three mètres; small doses of corrosive sublimate were ordered. Two weeks after, on Jan. 25, the pupil was active and vision had become $\frac{5}{20}$; the improvement had begun suddenly four days before. On Feb. 7, vision had further improved to $\frac{5}{7}$, and on April 18, it was $\frac{5}{5}$; ophthalmoscopically the eye appeared to be normal except for a faint perivascular line along the inferior retinal artery.

Case 2 was that of a woman, aged 39 years, who was first seen on Feb. 20, of this year. The left eye had suddenly become blind a week before; the heart was normal and her health was good. The eye could count fingers at five mètres; the pupil was inactive to light; the retinal arteries were reduced to threads. There was some œdema of the retina and the veins were beaded. Trinitrine was prescribed. On March 8, there was no change in vision or in ophthalmoscopic appearances. On March 17, the pupil was active and vision $\frac{6}{9}$. On May 1, vision was $\frac{6}{8}$; the left disc was slightly pale and its edges were slightly blurred; the arteries were small and the veins were normal. Mr. Story regarded both cases as examples of partial occlusion of the retinal artery.

The President observed that it was the obscurity of these cases which so greatly increased their interest.

Mr. A. H. Thompson suggested that in Mr. Story's second case the cause of obstruction might be obliterative arteritis, as shown in some cases by Reimar of Zürich. The narrowing of the artery under varying degrees of blood-pressure resulted in temporary anæmia of the affected area and finally in permanent collapse or thrombosis of the vessel, with persistent blindness.

Dr. Johnson Taylor referred to a case of a patient with frequent obscuration of vision in the right eye without fundus changes and with perfect vision in the intervals of attack, which he attributed to spasm of the central artery.

Dr. Argyll Robertson said that the case with temporary obscuration in one eye resembled a condition described by Benson at the International Congress. The loss of knee-jerk on one side gave increased interest to the condition of the pupil reflex.

Mr. Priestley Smith considered that the importance of these temporary attacks of obscuration of vision lay in the probability that at some time it might become permanent, giving particular point to early treatment and guarded prognosis. He cited an instance of a policeman changing from night to day duty and taking two meals with only a short interval, falling asleep of plethora and awaking blind in both eyes but recovering the sight of one. In some cases, too, after removal of the ovaries a similar condition had ensued. He attributed these to vascular changes set up by reflex disturbance. In uric acid poisoning, anæmia, and arteritis temporary blindness occurred and was probably due to similar changes to those which occasioned migraine in gastric disturbance and anæmia. In migraine temporary paralysis of the third nerve sometimes occurred. He recommended antipyrin as an immediate remedy in the attack and subsequently hot-water potations, with alkalies and salicylic acid, as in gouty conditions.

Mr. Juler had seen Dr. Beevor's case before hearing his opinion and was disposed to attribute the loss of vision to thrombosis following on changes produced by a blow, which the patient had received at polo, previously attended with bleeding from the ear on the same side.

Mr. Cant cited the case of a young girl with attacks of blindness occurring in the right eye once a week and lasting from ten to fifteen minutes. He saw her at intervals during nine months; only on one occasion did he witness an attack. The eye became permanently blind and there was the distinct cherry-red spot at the macula. She has since had similar temporary attacks of amblyopia in the left eye, and two months ago a large hæmorrhage occurred in the left eye. The general health was good, except for defective and painful menstruation.

Mr. Marcus Gunn, referring to the first case, said that the obscuration lasted from two to five minutes, recovery being absolute. The condition of the artery was unmistakable. Argyll Robertson pupil was not present. The condition suggested that of migraine.

Dr. Beevor, in reply, stated that the condition of the patient suggested locomotor ataxy. The knee-jerk was, however, not quite absent and the disorder had lasted since the patient was seven years old. Other distinctive signs of ataxy were not present and the pupil was unaffected. In regard to the polo accident, in this case, he thought that it was too remote, having preceded the attack by three months.

Mr. Kenneth Scott related a case of traumatic division of both optic nerves. An Egyptian native, aged 23 years, was sent to the Kasr-el-Aïni Hospital at Cairo, after attempted suicide. A bullet had entered the right temple, traversed the head, and passed out at the left temple; it had passed from side to side below the base of the skull in a direction downwards and forwards. Both eyeballs were completely protruded and lay on the cheeks, the right one hanging down 19 millimètres and the left one 15 millimètres. Both eyes were dark, discoloured, and flattened; it was obvious that both optic nerves had been torn across and that the globes had been ruptured. The damaged eyes were removed and it was found that both orbits had been traversed by the bullet and the base of the brain had been shattered, as there were fragments of bone and brain matter in the right orbit. The patient did not long survive the injury.

Mr. J. T. Thompson cited the case of a man who attempted suicide by shooting himself in the temple. The right eye was ruptured and the left was proptosed. He was totally blind, but survived two years.

A special meeting of the Society was held on June 9, Mr. H. R. Swanzy, President, in the chair, to consider the Operative Treatment of Myopia.

Mr. Richardson Cross opened the discussion with his paper. He considers that the operative treatment of myopia in properly selected cases has gone beyond the experimental stage, and should rank as a thoroughly recognised surgical procedure. Slight degrees of myopia are little more than an inconvenience, which can be remedied by proper rules of management and suitable lenses. In the higher degrees of myopia, we have to deal with a serious defect of vision, so that even with fully correcting glasses the visual acuity remains below normal, and handicraftsmen, labourers and domestic servants are thus often unfitted to earn a livelihood.

He recommends that myopes should wear their fully correcting glasses whenever it is possible, as he considers this to be the best means of preventing progressive development of the defect. Where, however, the degree of myopia is very high the lens which gives the best correction often cannot be worn. Various operations have been suggested at different times for the relief of high myopia, but all agree now that removal of the lens is the only method likely to be of service. Apparently the first published cases of operation on the lens for myopia were those of Weber, at the Heidelberg Congress in 1858. In his paper he recommends extraction of the lens, and quotes cases in which he obtained good results. V. Graefe condemned the operation on the ground of its great risk, and because it did not cure the choroidal disease which was the primary cause of the myopia, and the operation appears not to have been taken up. Fukala, a pupil of Arlt, should get the credit of opening up the question in 1870, and in 1889 he read a paper on the subject, giving the results of sixteen operations. He advocated repeated discissions.

Vacher, in 1890, also recommended, apart from Fukala, removal of the lens, and published his cases. Mr. Cross gives a historical *résumé* of the operations devised, and mentions the surgeons who have practised them.

Fukala claims the following advantages for removal of the crystalline lens :—

Distinctness of distant vision and improvement of visual acuity.

Patients are enabled to work at the distance of ordinary useful sight without glasses, or with glasses which are easily borne.

The position of the head and body is improved.

The retinal images are larger, more light falls on the retina, and the optical apparatus of the eye is simplified.

The injurious influence of accommodation is removed, and the tendency to further increase of the myopia is diminished.

Operation.—Mr. Cross advises discission of the lens, with subsequent linear extraction (= curette evacuation) in young subjects, before or as soon as tension is manifested. In young children simple discission is often sufficient. In older patients, where eye conditions are not so satisfactory, he advises a preliminary iridectomy followed by slight discission of the lens previous to extraction. In adults he has also removed the transparent lens by simple extraction. He considers that the discission should be limited to the anterior capsule. If the posterior capsule be divided, the lens may swell towards the vitreous; when this happens the anterior chamber becomes very shallow, tension is raised, and it is very difficult to get at the swollen part of the lens to relieve the condition.

Great care should be taken to avoid prolapse of vitreous or iris. Special risks are run in the discission of highly myopic eyes. In his opinion the operation is contra-indicated when the vitreous shows signs of marked degeneration, if the tension is low, and if there is a tendency to intra-ocular hæmorrhage.

Choroiditis or degenerative changes in the choroid if moderate in degree do not absolutely contra-indicate operation. If central vision is impaired, the prognosis is grave, but by no means hopeless. Detachment of the retina has no doubt frequently taken place after operation for high myopia, and in his judgment the operation is more likely to cause than to cure the detachment, but probably the danger of the occurrence has been overstated. The best subjects for operation are the young, in whom the retina is rarely detached; on the other hand, children are rarely very myopic, but if the case is obviously one of progressive myopia, the operation should be undertaken.

The cases which most frequently apply for help are domestic servants and labourers—young adults who are unable to get situations. The worst eye should be operated on first, the better one being left for close work.

He does not regret having undertaken a single case of the 48 on which he has operated. He gives a table showing the results of his cases.

Not only is the vision improved in almost every case, and in some very greatly, but the general aspect of the patients is changed; they lose their dreamy manner, gain confidence, and take interest in their surroundings.

The President, Mr. Hartridge, Mr. Lang, Mr. Collins, Mr. Cargill, Mr. Frost, Mr. Batten, Mr. Wray, Mr. Critchett, Mr. Jessop, Mr. Stephenson, Mr. Lawford and Mr. Doyne took part in the discussion, and Mr. Cross replied.

RELATION BETWEEN VISUAL ACUITY AND EFFICIENCY.

By Archd. Stanley Percival, M.A., M.B., B.C., Cantab.

Ophthalmic Surgeon to the Children's Hospital, Newcastle-on-Tyne.

"The problem of estimating the percentage of loss sustained by accident or disease of one or both eyes, according to the resulting degree of impairment of their visual functional activity, is one that does not admit of a solution equally applicable to all circumstances. For different occupations and trades the degree of visual acuity, which is just sufficient for the particular requirements of efficient work, varies within wide limits":—this is what Dr. Berry says in his paper on this subject.[1]

It will be my endeavour in this paper to suggest the tentative use of a formula that shall be simple, and at the same time more generally applicable than the expression Dr. Berry gives. My thanks are due to Dr. Berry for calling my attention to the subject, and the sort of way in which it can be treated.

The problem of estimating the amount of loss sometimes comes before us from an injured patient who wishes to claim compensation from an insurance company or from his employers. As such cases are frequently brought into the law-courts, it is very

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[1] *Trans. Ophth. Soc.*, vol. xiii., p. 223.

Ophth. Review. Vol. XVIII., No. 214, August, 1899.

desirable that some fair basis should be accepted on which such an estimate may be given.

(1) Binocular vision.—The extent of the visual field with both eyes is about 180°, with one eye it is about 150°. There is, therefore, a loss of about $\frac{1}{6}$ of the visual field where one eye becomes blind; but it must be remembered that it is the peripheral part of the field that is lost, and this is in no way so valuable as the central part of the field, which is seen much more acutely. Again, the loss of binocular vision means the loss of a ready and accurate perception of the third dimension of space. The loss is not absolute, for by moving his head the patient can still, though imperfectly, judge the relative distances of objects. In addition to this should be added a slight loss from the fatigue of only using one eye, and from the risk of losing the one remaining eye. I think we may conclude with Dr. Berry that the loss of efficiency, due to all these factors, may be reckoned as $\frac{1}{6}$ of the total efficiency.

(2) With regard to the question of visual acuity the problem is much more difficult. A patient whose visual acuity has been reduced by an accident to $\frac{6}{12}$ or $\frac{1}{2}$ in each eye has not suffered a loss of 50 per cent. The half-vision that remains to him is much more valuable than the half that he has lost. The whole question resembles the well-known one in economics about the marginal utility of a commodity.

The formula that I would suggest is the following:—Let E denote the total efficiency, and let e denote the efficiency of vision, excluding the binocular element B.

Then

$$\mathrm{E} \qquad e + \mathrm{B}, \text{ and } \mathrm{B} = \tfrac{1}{6}\,\mathrm{E}.$$

Now if S denote the sum of the visual acuities, and if D denote the difference between the visual acuity of each eye,

$$e = \tfrac{5}{6}\,\frac{2S}{S+2}, \qquad B = \tfrac{1}{5}\,e\,\frac{S-D}{S+D}.$$

The expression for B may seem unnecessarily complicated, but binocular vision (B) undoubtedly increases with the efficiency e; it is diminished as D is increased, and is absent when $S=D$, as occurs when one eye is lost. Further, when $D=0$, as in normal vision, $B=\frac{1}{6}E$.

Example.—Take a case of normal vision, $V = \frac{6}{6} = V' = 1$, $S = 2$, $D = 0$.

$$E = e + B = \tfrac{5}{6}\,\frac{2S}{S+2} + \tfrac{1}{5}\,e\,\frac{S-D}{S+D} = \tfrac{5}{6}\,\tfrac{4}{4} + \tfrac{1}{5}\,\tfrac{5}{6}\,\tfrac{4}{4}\,\tfrac{2}{2}$$

$$= \tfrac{5}{6} + \tfrac{1}{6} = 1.$$

The loss of efficiency (L) is clearly $1 - E$. If C is the compensation given by an insurance company for total blindness, the amount a person can reasonably claim for partial blindness is LC. A table below is given in which the amount of loss is calculated according to this formula to four places of decimals.

Examples.—What should be the claim of a patient to whom an accident has happened which has reduced the visual acuity of each eye to $\frac{6}{12}$? Then $V = V' = \frac{1}{2}$; $S = 1$, $D = 0$.

$$E = e + B = \tfrac{5}{6}\,\tfrac{2}{3} + \tfrac{1}{9} = \tfrac{2}{3}. \quad L = 1 - E = \tfrac{1}{3}.$$

Then according to this formula he can reasonably claim one-third of the compensation for total blindness.

If one eye is lost, $V' = 0$, $V = 1$, $S = 1 = D$.

$\therefore$ the expression for B vanishes.

$$E = \tfrac{5}{6}\,\tfrac{2}{3} = \tfrac{5}{9}. \quad L = 1 - E = \tfrac{4}{9}.$$

If $V = \frac{6}{12}$, $V' = \frac{6}{24}$, $S = \frac{3}{4}$, $D = \frac{1}{4}$.

$$E = e + B = \tfrac{5}{6}\,\tfrac{6}{11} + \tfrac{1}{11}\,\tfrac{1}{2} = \tfrac{11}{22}. \quad L = 1 - E = \tfrac{1}{2}.$$

Such a patient could reasonably claim one half of the compensation for total blindness.

Dr. Berry estimates the loss (L) for complete homonymous hemianopia as $\frac{1}{3}$. I would certainly distinguish between right and left hemianopia. If L for the loss of the left half of the field of vision is to be estimated at $\frac{1}{3}$, I should assess L due to the loss of the right half of the field of vision at $\frac{1}{2}$, as reading or writing with this form of hemianopia is so much more difficult.

Of course if the patient's time were not employed in literary or other pursuits in which the right half of the field of vision is of especial consequence, this estimate of $\frac{1}{2}$ would be too high. The true economic solution of the problem can only be attained in an individual instance by considering the special circumstances of the case. It seems to me that the table below gives a fair estimate of the loss of efficiency in ordinary cases from impairment of the visual acuity in one or both eyes.

LOSS OF EFFICIENCY.

V = ‖	$\frac{6}{6}$	$\frac{6}{9}$	$\frac{6}{12}$	$\frac{6}{18}$	$\frac{6}{24}$	$\frac{6}{36}$	$\frac{6}{60}$	$\frac{1}{60}$	0
$\frac{6}{6}$	0	$\cdot\dot{1}\dot{4}$	·2143	$\cdot 2\dot{8}$	·3059	·3655	·3968	·4364	$\cdot\dot{4}$
$\frac{6}{9}$	$\cdot\dot{1}\dot{4}$	·2	·2939	$\cdot 3\dot{8}$	·4369	·4853	·5243	·5734	$\cdot 58\dot{3}$
$\frac{6}{12}$	·2143	·2938	$\cdot\dot{3}$	$\cdot\dot{4}$	·5	$\cdot\dot{5}$	·6	$\cdot 6\dot{5}$	$\cdot\dot{6}$
$\frac{6}{18}$	$\cdot 2\dot{8}$	$\cdot 3\dot{8}$	$\cdot\dot{4}$	·5	·5672	$\cdot 6\dot{3}$	·6854	·7493	·7619
$\frac{6}{24}$	·3059	·4369	·5	·5672	·6	·6743	·7319	·8013	·8148
$\frac{6}{36}$	·3655	·4853	$\cdot\dot{5}$	$\cdot 6\dot{3}$	·6743	·7143	·7804	·8572	·8611
$\frac{6}{60}$	·3968	·5243	·6	·6854	·7319	·7804	$\cdot\dot{8}\dot{1}$	·9051	·9206
$\frac{1}{60}$	·4364	·5734	$\cdot 6\dot{5}$	·7493	·8013	·8572	·9051	·9672	·9862
0	$\cdot\dot{4}$	$\cdot 58\dot{3}$	$\cdot\dot{6}$	·7619	·8148	·8611	·9206	·9862	1

JOCQS & OTHERS. Dacryo-cystitis in Infants.
La Clinique Ophtalmologique, May 10, 1899.

Most authors attribute dacryo-cystitis in the new-born child to an imperforate condition of the lower extremity of the nasal duct ; the inflammation is, as in the adult, preceded by lacrymation of that eye, with a certain degree of redness of the inner angle of the lids owing to the retention of the tears.

According to the researches of M. Cosmettatos, the lacrymal canal starts from the sac, forms a fibrous, solid cord stretching down from the sac towards the nose, solid at first, but at a later period becoming pervious, this process having been seen in the human embryo, partially completed in the third month of fœtal life. The occurrence, then, of dacryo-cystitis in the infant is easy to understand, if we suppose in the first place that perforation of the whole length of this fibrous cord has not been completed before birth ; the contents will thus accumulate and distend the sac and canal, then become infected and we have a dacryo-cystitis. Immediately after birth there is in such cases a certain degree of watering of the eye, which increases as time goes on, and a slight angular conjunctivitis results. Restitution to normal may occur during this stage, even without treatment, before the condition has gone on to pus formation.

The purulent dacryo-cystitis itself may appear as early as the third day, in which case there is some danger of mistaking it for an ophthalmia neonatorum, but more usually it manifests itself without swelling of the sac or any obvious inflammatory phenomena one or several weeks later. From this fact it is evident that to describe the disease as congenital is not quite accurate, though this is often done.

In presence of a condition of simple lacrymation in the infant, then, Jocqs appears to indicate that the proper course to pursue is to endeavour to hasten the normal process of absorption of the fibrous band and its transformation into a patent duct, an aim which he considers will be best attained by somewhat vigorous injection of the nasal duct, in order that the passage which we may imagine to have begun to form even down to the lower meatus may be almost forcibly extended; he makes such injections by way of the lower canaliculus with an aseptic or feebly antiseptic lotion, in order to prevent any risk of septic infection of the contents of the sac. In his opinion it is not necessary to pass any probe; injection of fluid has been sufficient in all his cases. When abscess of the sac is actually present, frequent pressure over the sac should be employed, in the hope that the fluid thus expressed from it may help to open up the lower extremity of the nasal duct, and in addition he advises frequent instillations, in fact, after each occasion of emptying the sac, of an antiseptic lotion; for this purpose he knows of nothing better than 20 per cent. protargol. He looks for a good result from this treatment in the great majority of his cases; but the condition is, fortunately, not very common. Jocqs gives references to the more recent contributions to the literature of this subject.

S. SNELL. A Practical Guide to the Examination of the Eye. *Edinburgh and London: Young J. Pentland*, 1898.

This handy guide is intended for students and junior practitioners, and will be found very useful by them. It is written in a clear and simple style, and the author has avoided everything requiring abstruse explanations and confined himself to practical matters. The illustrations are for the most part clear and well chosen, though a few have rather suffered in the process of reproduction.

The introductory words, "To the trained observer a glance at a patient or a remark from him will suffice to indicate the direction in which the enquiry should b turned," are suitably followed by a table for the "systematic and complete" examination of the patient, in which, however, under the heading "Organs of Generation" only these three points are enumerated: menses, leucorrhœa, and uterine disease, the male sex with its important possibilities of gonorrhœa being completely forgotten.

On page 32 we read: "For the detection of foreign bodies in the vitreous, photography by means of Roentgen's X-rays has been used in a few cases. The difficulties in the case of the eye, surrounded as it is by bony walls, are very great, and have not been altogether overcome." Since this was written (1898) the present writer has been able to show that the difficulties have been overrated by the author, and that they have been successfully overcome, so that in every single instance of foreign body within the eyeball it was correctly localised.

The mydriatics and myotics are treated with sufficient fulness. We thoroughly disagree, however, with the first part of the statement on page 42: "The regular use of a mydriatic in testing refraction in young people is, however, of the utmost importance, and is frequently called for even in adults."

The chapter on the Ophthalmoscope is treated exclusively from the practical side, and will therefore be welcome to the large number of those who have no liking for mathematics.

Under the Testing of the Sight of the Illiterate, the block-letter E turned in different directions, as introduced by Snellen and copied by Cohn, is given; but no mention is made of the "international" test types of Burchardt. It seems that these most valuable types are hardly known in this country; still for exactness and reliability they far surpass all the other test types in existence, and can be applied to children as well as to illiterate persons of al ages and nations.

On the other hand, Oliver's test words receive their due credit as a useful addition to the stock of tests at the disposal of the practitioner.

Under Abnormalities of Refraction (chapter vi.) we must take exception to the assertion: "Regular astigmatism is occasioned by congenital inequality in the curvature of the cornea." It is often easy enough to observe its development and to demonstrate the incorrectness of this statement. Of course the observations have to be carried on for a sufficient length of time, and must be made with the ophthalmometer or with Placido's disc.

The author's modification of Wurdemann's hand-frame of two series of concave and convex glasses is as simple as it is handy, and will prove acceptable not only to the beginner but also to the busy specialist.

For measuring the field of vision the transparent hemispherical perimeter by Ascher has not been mentioned.

The statement that all colours are perceived most vividly at the fixation point requires to be qualified in the case of blue owing to the yellow pigment of the macula.

On page 60 a misprint occurs. In palsy of the internal rectus compensation is effected by the head turning towards the sound eye and not, as printed, towards the affected eye. Otherwise the chapter on muscular affections is very clear and concise.

The print and the general get up of the book are all that could be desired, and an index at the end contributes to increase the usefulness of the little volume.

GONIN. (Lausanne). The Microbic Nature of the Various Forms of Conjunctivitis. *Revue Médicale de la Suisse Romande*, 2 and 3, 1899.

Ought one to continue the present clinical classification of cases of conjunctivitis into catarrhal, blennorrhagic, follicular, &c.? This is the question which Gonin discusses in a very interesting if somewhat copious article in which he details the results of his evidently very careful investigation of 365 cases of the disease in various forms. The "anatomical" method of classification is not precise enough to satisfy modern requirements, but though an exact bacteriological diagnosis may not be as yet possible in all cases, still it is simple enough for the great majority, and every day methods are being improved on and the decision made more simple and infallible. Even now, though the bacteriology of conjunctivitis is as yet in early childhood if not actual infancy, seven clearly defined types are to be differentiated, and more will follow by-and-by. These seven are: (1) gonorrhœal, due to Neisser's gonococcus, in which connection it is to be remarked that not all cases of ophthalmia neonatorum are examples of gonorrhœa; (2) diphtheritic, due to Lœffler's bacillus, and here it falls to be noticed that in a number of instances of very mild inflammation (and even of normal conjunctiva ?) the Lœffler bacillus, or one as yet indistinguishable from it, is to be discovered; (3) acute contagious conjunctivitis due to the Koch-Weeks bacillus; (4) subacute conjunctivitis of Morax due to a diplobacillus; (5) pneumococcus conjunctivitis, of which it is possible that there are two varieties; (6) streptococcus conjunctivitis; (7) staphylococcus conjunctivitis, though it is admitted by Gonin that the presence of the S. albus, which is almost a constant inhabitant, cannot be held as of importance, and proof that the S. aureus is the cause of phlyctenular conjunctivitis is far from complete. Whatever may be the result of investigations into the nature of trachoma, follicular conjunctivitis and spring catarrh, their bacteriology is not as yet, at all events, "within the range of practical politics."

In order, then, to settle the relation between the anatomical and the bacteriological diagnosis, Gonin, as above indicated, examined with care 365 cases of conjunctivitis which would have ranged themselves in the former category under the headings of catarrhal, purulent, and pseudo-membranous inflammations. He first set before himself certain practical questions to the following effect: (1) is microscopical examination of the conjunctival secretion possible as a matter of practice ? (2) in what proportion of cases is it likely to be efficient ? (3) are the results obtained such as to permit of a classification of conjunctivitis on them as a basis? (4) does such an etiological classification offer any improvement upon the anatomical mode? (5) is such advantage commensurate to the amount of labour involved? And, further, it was necessary to determine three points, viz.: The relative frequency of different forms, to what extent one clinical picture agrees with one microbe, and what are the associated microbes with which one meets and what influence these have upon the clinical picture.

We do not in this review propose to deal with all these questions in detail, but even a brief account of Gonin's work conveys to some extent an answer to them. In the first place, it must be mentioned that he did not include in his investigations any cases except such as would have been called catarrhal, purulent, or pseudo-membranous; phlyctenular, traumatic, &c., lesions were excluded. In the 13 cases of pseudo-membranous conjunctivitis he found Lœffler's bacillus (with others) seven times, staphylococcus four times, Weeks's bacillus and pneumococcus once each. In the 42 cases of purulent conjunctivitis he found the gonococcus twenty-eight times, Weeks's bacillus eight times, staphylococcus and streptococcus once each, various organisms in two cases, and none at all in two more. In the 310 catarrhal cases he found diplobacillus one hundred and eighty-five times, Weeks's bacillus ten times, pneumococcus ten times, streptococcus five times, staphylococcus eighty-three times, various bacilli in six cases, and in eleven none at all. On taking by themselves the 38 cases of conjunctivitis in the new born, one finds the gonococcus twenty-two times, staphylococcus alone five times, pneumococcus four times, Weeks's bacillus three times, various forms twice, and in two instances no microbes. It is thus abundantly manifest that the anatomical and the bacteriological diagnoses do not correspond.

In his paper Gonin proceeds to describe the different varieties of conjunctivitis under their bacteriological headings as pneumococcus conjunctivitis, &c., and goes on to say, with justice, that it is obviously much simpler to record a diagnosis of "catarrhal conjunctivitis" than to decide whether it is due or not to Weeks's bacillus for example, but the question arises whether it is of more value rapidly to recognise the clinical variety or to arrive at a delicate appreciation of the ultimate cause. For a clinical description is not of necessity in itself a diagnosis. One difficulty which is always a stumbling block in the way of an etiological diagnosis is the frequent if not constant presence of certain micro-organisms in the conjunctival sac, even under normal conditions; the existence of such when inflammation is present is manifestly of no causative import, unless indeed other circumstances are altered also, and in addition Gonin thinks one should take into consideration the route by which a microbe has reached the eye; thus, for example, a "lacrymal" conjunctivitis may arise from a variety of microbes, but the route by which such germ has arrived is the same.

For these and other reasons the author admits that in the meantime, at all events, a purely etiological classification is not practicable; indeed, he seems to us almost to cut the ground from beneath his own feet by an admission so damaging. He makes a primary classification of the germs of conjunctivitis into three groups; in the first he places those varieties of conjunctival inflammation of which the cause is already well known, and which possess, therefore, distinctive characteristics. Under this heading are ranged four forms, viz., gonorrhœal, acute contagious, which he prefers to call "Weeks's conjunctivitis," diplobacillary (due to Morax's germ) and diphtheritic (Lœffler). In regard to this last there are certain difficulties in the way of accepting his conclusions, as we have seen already. In the second group Gonin places those forms of which the specific agent is not known, or, at all events, cultivations of the germs present in which do not reproduce any very precisely marked clinical picture. This group will include all other forms of conjunctivitis by infection; those which can be produced by certain staphylococci, streptococcus, pneumococcus, and various other organisms less satisfactorily differentiated as to their clinical effects. The treatment of cases of inflammation falling into this group does not lend itself so well to strict rules as do those of the first group; they may be divided into two sub-classes according as the infection comes from without or by way of the lacrymal apparatus. In this transition group trachoma and phlyctenular ophthalmia fall to be included, and then follows a third group, that namely of non-microbic conjunctivitis, or those in which one discovers only saprophytic forms. In this group are placed spring catarrh, traumatic conjunctivitis, (strictly) catarrhal conjunctivitis, and those inflammations whose chronicity prevents the precise recognition of their original character. In answer to his questions and difficulties propounded at the outset, Gonin after exhaustion of his subject for the meantime comes to the following conclusions: For the great majority of cases an etiological classification is quite possible, and though it is greatly facilitated by microscopic examination of the secretions, this can only be regarded as secondary to the clinical diagnosis. In certain varieties the microbic diagnosis is made with great ease, especially in diplobacillary and gonorrhœal forms, but it is sometimes less simple and less conclusive—for example, in diphtheria and the cases produced by staphylococcus. Out of his total of 365 cases the microscopic examination might, he tells us frankly, have been omitted in 200; that is, the diagnosis was complete without it, it added nothing which was not already known from the clinical appearances; but, on the other hand, in eighty instances microscopic examination was a necessary preliminary to an exact diagnosis. From a different point of view, in 245 of the cases, or about two-thirds of the whole, microscopic examination of the secretion gave conclusive results; in 90 cases negative results; and in 30 only an equivocal answer.

F. OSTWALT (Paris). On Periscopic Glasses. *v. Graefe's Arch., xlvi.*, 3.

The use of periscopic glasses has gradually increased since their first introduction by Wollaston in 1803. To the patient they have the advantage that they clear the lashes better than the ordinary lenses, and at least for some foci cause less distortion when looking in a lateral—excentric—direction. Once accustomed to periscopic glasses the patient prefers them and asks for them again from his oculist when any change of focus becomes necessary.

But when it comes to prescribing them one is left completely at the mercy of the manufacturer, since it is obvious that any given refractive power may be obtained by an almost endless variety of combinations of convex and concave menisci, all that is necessary being that the algebraic sum of refractive indices be equal to the refraction prescribed.

The various lenses of such a series, though all of the same focus, are of very different value in other respects, and Ostwalt, who points out the fact that hitherto the oculist has had no sufficient data to enable him to select and order the most suitable form, has undertaken theoretically to clear up this unsatisfactory state of affairs.

In a short historical sketch the passage in which Wollaston recommends "periscopic" lenses is quoted, showing that he does not mention the principles according to which his optician was making them. The point of paramount importance, namely, the different refraction of a ray of light falling obliquely on the periphery according to the different degrees of curvature of the menisci forming the surfaces of the lens has never before received attention.

Hirschberg is the only one who has given any direct statement about the curvatures to be given to a periscopic glass. It appears that he considers such a glass as most perfect if it gives the least amount of spherical aberration for a beam of parallel rays. This gives occasion to the author to show that if spherical aberration were the only criterion for usefulness of a periscopic lens, Hirschberg's remark would hold good for convex lenses, whereas for concave menisci it would be completely wrong even for those of very weak refractive power. Ostwalt emphasises thereupon the necessity first of deciding for the various menisci the question which is the most favourable form from a periscopic point of view, and secondly, of seeing whether the use of these menisci might have to be restricted on account of too large an amount of spherical aberration.

A homocentric beam of rays falling obliquely on a spherical surface of a breaking medium does not remain homocentric after being refracted, but becomes astigmatic, a fact already mentioned by Thomas Young. The author now sets himself the following task. Supposing a meniscus to be placed with the centre of its anterior—outer—surface 30 millimetres from the rotating centre of an eye (about the usual distance in which glasses are worn), what must be the curvature of the two surfaces of the meniscus for which the minimum amount of astigmatism is produced at an angle of 25° from the centre (the apex of this angle to be in the rotating centre of the eye).

The author gives a detailed solution for a lens of — 4 D. focus as an example of the mode of calculation and of constructing graphic curves. He comes to the unexpected result that the astigmatism is greatest for the plano-concave lens, decreases rapidly in direct ratio to the increased curve of the meniscus, disappears altogether for a periscopic lens with the two surfaces of + 2·75 and — 6·75 respectively, then becoming inverted gradually increases a little, and decreases again, disappears a second time for a periscopic glass of the formula + 14·0 and — 18·0. Beyond this the astigmatism increases again slowly in the original sense. For bi-concave glasses the astigmatism is still greater than for the concavo-plane lens.

Two periscopic glasses, therefore, exist of the value of — 4 D., which are free from astigmatic effect for any ray that may strike the lens at an obliquity up to 25°. Of these two lenses the lens + 2·75 and — 6·75 is preferable, because it has less spherical aberration, its manufacture is easier, it requires a thinner block of glass to cut it from, and can therefore be cut out of the glass ordinarily used for spectacle glasses, does not necessitate the use of some such optical glass as crown glass, and is therefore—last, not least—very much cheaper.

After giving a series of curves for concave menisci of other refractive powers, Ostwalt gives the result of his investigations for the various concave glasses that are of clinical value, in a curve which we here translate into a tabulated list. The figures for the curves are given in dioptrics (as approximate to the ordinary mould as we could interpret it), whereby it must be remembered that they represent curves of double the refractive power of those used for the ordinary bi-concave lens (or the same as used for the spherical surface in our ordinary sphericocylindrical lenses).

Value in Dioptrics	Front	Back
— 1·0	+ 2·0	— 3·0
— 1·5	+ 2·5	— 4·0
— 2·0	+ 3·0	— 5.0
— 2·5	+ 3·0	— 5·5
— 3·0	+ 3·0	— 6·0
— 3·5	+ 3·0	— 6·5
— 4·0	+ 2·5	— 6·5
— 5·0	+ 2·0	— 7·0
— 6·0	+ 1·5	— 7·5
— 7·0	+ 1·0	— 8·0
— 8·0	+ 1·0	— 9·0
— 9·0	+ 0·5	— 9·5
— 10·0	0·0	— 10·0
— 11·0	+ 0·5	— 11·5
— 12·0	+ 2·0	— 14·0
— 13·0	+ 1·0	— 14·0
— 14·0	+ 1·0	— 15·0
— 15·0	0·0	— 15·0
— 16·0	— 1·0	— 15·0
— 17·0	— 1·0	— 16 0

It is worthy of note that for two lenses, — 10 and — 15 D., the plano-concave form is the most favourable, and for none is a stronger "bending" required than corresponds to a refractive power of 3 D., an important factor when the cost of manufacture is concerned.

Examining the convex lenses Ostwalt comes to the result that the weak convex menisci are of no use from the periscopic point of view, in direct contradiction to the hitherto accepted notion of their value in this direction, while strong convex menisci are altogether out of the question, for the same and other more obvious reasons.

At the end of this very instructive paper, which to do it full justice would have required a verbatim translation, the author comes to the conclusion that henceforth the ordinary bi-concave glasses ought to be avoided altogether, and to be replaced by the glasses as given in the above table.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

H. R. Swanzy, F.R.C.S.I., President, in the Chair.

Friday, July 7, 1899.

Papers:—

Changes in the Conjunctiva produced by Chronic Inflammation.—Major H. Herbert, I.M.S. He said that (1) in the conjunctiva one might trace the development of normal adenoid tissue from ordinary connective tissue. The cells became more numerous, and many connective tissue cells were changed into large plasma cells diffusely scattered, and into small round cells, mostly grouped into follicles and lymph heaps. These small round cells, or lymphocytes, were young plasma cells, and always had among them larger plasma cells undergoing mitosis. (2) In follicular conjunctivitis and trachoma the new follicular formations might differ from normal in being deficient in supporting stroma and blood vessels. The first stage of deficiency was seen in columns of young cells lying free in lymph spaces; a more advanced stage was found in much larger collections lying in lymph vessels, encapsuled by the vessel walls. (3) In the retrogression of follicles the cells were (*a*) carried away in the lymphatics, or (*b*) became amœboid and travelled to the surface, or passed directly into small blood vessels, or (*c*) underwent colliquative and hyaline degeneration. (4) Scar tissue might be formed in very chronic simple conjunctivitis. (5) Large palpebral papillæ like those of spring catarrh might develop from trachoma follicles (cases were quoted and tissues shown). (6) Conjunctival cysts in great number in the upper tarsal membrane might arise from distension of tubular epithelial downgrowths, the result of chronic, generally trachomatous, conjunctivitis (a series of cases analysed and cyst contents investigated). (7) Stellwag's brawny trachoma appeared to be due to a basophile degeneration of connective tissue fibres.

Mr. Sydney Stephenson, after remarking on the value of the new methods of staining, said he had been interested to note that in trachoma the changes began in the lymphatic spaces and follicles. This explained the enlargement of the preauricular and cervical glands, and occasionally of other glands, seen in this disease. He also remarked on the unimportance of goblet cells, and of mast cells found in the conjunctiva. He asked if Major Herbert had been able to find any difference between follicular and granular conjunctivitis in his specimens.

In reply, Major Herbert said he had been unable to detect any difference.

Plastic Operation for Contracted Socket.—Mr. F. Richardson Cross. He said that last year he showed a case on which he had operated for contracted socket. The operation consisted in making a horizontal incision across the socket, followed by a dissection upwards and downwards of the conjunctiva, in such a way that the conjunctival tissue thus raised formed a lining for the upper and lower lids respectively. To cover the now raw posterior surface of the socket he introduced a flap of skin taken from the temple, twisting it on its pedicle. The case had done well. Recently he had modified the operation by taking a finger-like flap from the upper lid to line the socket instead of from the temple. This did not cause so much disfigurement, and the skin flap assumed a conjunctival character much sooner.

In answer to the President he said that no ectropion resulted.

A Case of Penetrating Wound of the Orbit followed by Meningitis; Trephining; Recovery.—Dr. Rockliffe and Mr. Hainworth. The patient was struck in the left eye in a drunken brawl by a seaman, evidently with a pipe in his hand, whereby the stem, three and a-half inches long, mounted by a copper band, was driven deeply into the orbit; a considerable amount of force was required to dislodge it from its firm position, and when removed the stem was plugged with some doubtful matter. The wound being thoroughly cleansed by perchloride and dressed with carbolic, all went well until the seventh day; when, preceded by frontal headache, the pulse dropped to 48, and the temperature became subnormal; followed on the eighth day by a rigor and rise of temperature to 102·2°. A localised abscess being suspected, the left temporal region was trephined; no pus was found, but a considerable amount of fluid withdrawn by a trocar from the lateral ventricles. With the exception of further rigors, accompanied by subnormal pulse, the patient made a complete recovery in one month, during which he had right partial facial paralysis, left external strabismus, and partial aphasia, due, as Mr. Hainworth surmised, to irritation of the sixth nerve, and damage to Broca's convolution by the trephine, the rigors being possibly explained by some irritation set up around the seat of the operation. Cases were quoted showing the usual frequent mortality in such injuries.

Card Specimens. — Mr. Lindsay Johnson: Macula Chromoscope.

Mr. J. D. Amenabar: Suction Apparatus for Soft Cataract.

Mr. H. Juler: Sclerosing Keratitis.

Mr. C. D. Marshall: Two Specimens showing grains of Gunpowder in the Eyeball.

Mr. John Griffith: (1) An unusual form of Retinitis; (2) A Microscopic Specimen of a Perithelial Sarcoma of the Choroid.

Mr. H. Grimsdale: A Case of Nævus of the Iris associated with Multiple Nævi on different parts of the body.

Mr. W. T. Holmes Spicer: Persistent Œdema of the Lids in a boy who had an atrophic condition of the skin of the ears and neck; there was no conjunctivitis nor any history of attacks of erysipelas.

Mr. F. Richardson Cross: A Dressing Basket for Eye Work.

Mr. Doyne: Opacity of the Cornea which was spreading centripetally, associated with a mild iritis.

Mr. Arnold Lawson: A Case of Spring Catarrh.

Mr. Donald Gunn: A Case of Tuberculous Disease of the Interior of the Nose, followed by Lacrymal Abscess on one side and Tuberculous Ulceration of the Conjunctiva on the other.

Election of Officers.—The annual general meeting was held afterwards for the adoption of the report. The following officers were elected for the next year:—*President:* *G. Anderson Critchett. *Vice-Presidents:* E. Nettleship, Henry Eales (Birmingham), W. A. Brailey, M.D., Priestley Smith (Birmingham), F. R. Cross (Clifton), George Cowell, *H. R. Swanzy, *P. H. Mules, M.D., (Wrexham), *Henry Juler, *S. J. Sharkey, M.D. *Treasurer:* John Abercrombie, M.D. *Secretaries:* James Taylor, M.D., E. Treacher Collins. *Librarian:* W. Adams Frost. *Other Members of Council:* Charles J. Oldham (Brighton), Howard H. Tooth, M.D., W. A. Turner, M.D., G. E. Wherry, M.B. (Cambridge), S. H. Habershon, M.D., J. B. Lawford, W. J. Cant (Lincoln), Sydney Stephenson, *George Mackay, M.D. (Edinburgh), *Patrick Maxwell, M.D. (Dublin), *Charles Shears (Liverpool), *W. T. Holmes Spicer. *The gentlemen whose names are marked with an asterisk were not on the Council or did not hold the same office during the preceding year.

OPHTHALMOLOGICAL SOCIETY OF PARIS.

April 11, 1899.

Recueil d'Ophtalmologie, April, 1899.

M. A. Terson. *Considerations on the ætiology of a case of Irido-Choroiditis.*

The author began by remarking that the study of the causation of endo-infections of the eye falls into three parts; first the microbe, secondly the soil, and thirdly, those occasional causes, such as cold, which formerly had an exaggerated importance attached to them, but which of late years have been unduly ignored. The following observation illustrates the important part which may be played by cold.

The patient, a man of 30, came to find out the condition of his left eye. It had been defective as long as he could remember, but never red or painful. On examination, the right eye appeared to be normal in every respect; in the left eye (where acuity was only $\frac{1}{10}$) there was a pigmentary choroido-retinitis, decreasing from the periphery to the centre and resembling the choroido-retinitis of congenital syphilis. A few months later, while in a boat at sea, the patient got so completely wet through that on his return it was more than three hours before he could get warm. The same night the left eye (the one affected by the choroido-retinitis) became red and intolerably painful. A few days later, when he was seen, the pupil was completely adherent, and remained so in spite of treatment with atropine, &c., one half of the field of vision was lost, and tension very low, pointing to a retinal detachment, while later the lens became opaque and the eye-ball began to shrink. As the pain ceased it was not excised.

This case, said the author, amounts to an experimental proof of the direct effect of cold in lighting up an old disease. Such cases, of course, are rare, but others in which the "occasional cause," though not so obvious could be discovered if it were looked for, are not so uncommon. "Certainly ocular fatigue, cold, slight traumatisms, overwork of the eye, the action of strong light—any of these are capable of putting the hitherto normal eye of a syphilitic in a state of receptivity"—all of which is obviously of great importance from the point of view of prophylaxis. As to the method by which cold acted in this case no opinion is hazarded. With the exception of the choroido-retinitis, no sign whatever of any disease was present, and the family history was good. The cause of the original disease is therefore obscure, but the recrudescence is paralleled by the influence of a general infection such as influenza or typhoid on an injured or diseased eye or on one the subject of congenital abnormalities.

M. ANTONELLI recalled a case in which a slight blow had lit up an old irido-cyclitis causing complete blindness of both eyes. In the litigation which ensued much contradictory evidence was given by the experts.

M. MORAX enquired how the term "endo-infection" was applicable to M. Terson's case.

M. TERSON replied that he had no theory, microbian or other, to put forward, but merely wished to provoke a discussion as to the mechanism by which in his case the undoubted effect of cold was produced.

M. MORAX said that since everything was hypothetical no interpretation of the facts could be of any interest.

M. E. VALUDE. *Two Cases of Retro-bulbar Neuritis.*

The first case occurred in a man of 43, whose left eye, being hypermetropic 5d. was as a rule not used. Owing to this circumstance the history of loss of sight in the right eye during a single night was clear. There had been no pain either in the eye or head. Five days later, on presenting himself for examination, nothing abnormal was found with the ophthalmoscope, but there was a large absolute scotoma. As the patient himself gave a history of partial anæsthesia resulting from emotional causes on several occasions, and of having recently been much worried by a considerable monetary loss, the provisional diagnosis was made of hysterical amblyopia. Ten days later the patient returned. The scotoma was considerably diminished in extent, and was no longer absolute.

Ophthalmoscopic examination, on the other hand, revealed a very manifest optic neuritis, with œdema of the papilla and ischæmia of the macular region. In the left eye the ophthalmoscopic appearance, except for one or two tortuous vessels, was normal, and the vision unchanged. It now came out that on the day before the loss of vision occurred the patient had been subject to severe cold, and that he was rheumatic. There was some tenderness of the globe, which, according to the patient's own account, had first appeared nine days after the loss of vision, and there was pain on movement. After three weeks' treatment by blisters, salicylate, and bandaging, normal acuity of vision was restored without any scotoma, the only remaining ophthalmoscopic evidence of disease being slight woolliness of the disc and pallor of its outer side. The case was remarkable, first for the unusually long interval between the loss of vision and the onset of other symptoms; secondly, for its remaining absolutely monocular; and thirdly, for its ending in complete recovery.

The second case was that of a woman of 35, with a history of miscarriages pointing to syphilis. The first symptoms were violent headache, and ptosis on the *right* side. A month later she experienced a sudden loss of vision in the *left* eye. On the day following she was found to have an œdematous optic neuritis in the left eye, while the right, except for the ptosis and paresis of the superior rectus, appeared to be normal. Three days later profuse hæmorrhages were seen in the left fundus, and the field was reduced to a small segment to the outer side of the fixation point. Three weeks' treatment with subcutaneous injections of mercury and iodide had no apparent effect on the left eye, which passed on into a state of complete optic atrophy, all vision being lost. In the right eye, however, the paralysis passed away and the fundus remained normal.

Six months later the power of smell, previously intact, was lost, ordinary sensibility being also somewhat affected both in the nostrils and conjunctivæ. Six months later still no change had occurred.

The author's interpretation of this case was that there had been a syphilitic periostitis of the left optic canal, and that this periostitis had extended intra-cranially somewhat to the right side so as to involve both olfactory nerves. The affection of the muscles on the right side he considered was an independent syphilitic lesion.

M. Antonelli remarked that the first case resembled cases of unilateral optic neuritis, due to influenza, that he had seen. As to the second case, it might have been an affection of the periosteum, of the nerve sheaths or of the vessels. He recalled a similar case in a girl of 20, the subject of hereditary syphilis, where the sequence had been loss of vision, papillitis, hæmorrhagic neuro-retinitis, all monocular. Here, however, specific treatment was followed by restoration of vision.

M. Morax suggested that in M. Valude's second case the lesion was a vascular one situated behind the papilla.

M. Valude replied that this theory did not account for the other symptoms.

M. A. Antonelli. *Treatment of lacrymal affections by styles of Protargol.*

The author said that as syringing with protargol in lacrymal affections had had such good results, and since its chief advantage over nitrate of silver consisted in its being more diffusible, while to secure this advantage it was necessary for it to remain in contact with the mucous membrane some considerable time, he had had made the styles of protargol which he exhibited. They consisted of 50 per cent. protargol in gelatine, their calibre being that of No. 3 or No. 4 Bowman's probes, and their length 3 or 4 centimètres. He had begun with a lower percentage of protargol, but found very few cases that did not completely tolerate 50 per cent. In order to introduce them he previously passed a No. 5 or No. 6 Bowman's probe. It was a good plan to moisten the style before introducing it, and to avoid breaking it on its passage from the canaliculus into the duct required a certain amount of dexterity. The style once in the duct caused no inconvenience, and took five or six hours, or even longer, to dissolve, as proved by the colour of the mucus from the nostril.

The author had employed these styles in about 20 cases either of chronic dacryo-cystitis with or without dilatation of the sac, or else of mucocele becoming purulent at intervals. One of the canaliculi, or sometimes both, had always been slit up previously. His first case was a slight but intractable muco-purulent regurgitation in which syringing with protargol had no effect, but which was cured by the introduction of ten 50-per-cent. styles. Another case was an old trachomatous one in which No. 5 Bowman's probe was easily passed, but grated against bare bone at the entrance of the duct from the sac. Four protargol styles introduced every other day were sufficient to stop the secretion, bare bone being no longer felt with the probe. The treatment had proved efficacious in two cases of hypopyon-keratitis of lacrymal origin with very fetid ozœna, and also in a case of acute dacryo-cystitis with much swelling of the sac. If these styles had any disadvantage it was that they produced a too rapid cicatrisation when the periosteum was deficient, giving rise to strictures later on, and the necessity for further treatment.

M. Gorecki remarked that M. Maisonneuve used to employ styles of chloride of zinc. They did away not only with the suppuration but with the lacrymal passages themselves. On the whole the results were good.

M. Valude distinguished between those cases of dacryo-cystitis in which there was no dilatation of the sac and those in which there was. The former cases were curable by syringing, probing and styles; the latter required operative treatment—if the dilatation was simple, extirpation of the sac, if inflammatory, destruction of the sac by the cautery.

M. Jocqs said that the treatment by styles could only cure cases of uncomplicated dacryo-cystitis. In cases of "chronic lacrymal tumour" authors, and with them ophthalmic surgeons, were wrong in speaking of dilatation of the sac. The tumour, whether mucous or purulent, was in all cases not the sac itself but a præ-cystic pouch developed in the surrounding cellular tissue, and connected with the sac by a fistula in its anterior wall. So long as the opening remained the contents of the pouch could be emptied by pressure; when it was closed this could no longer be done. He asserted that this variety of dacryocystitis could only be cured by operation.

M. TERSON: The slitting of the canaliculus appears to me almost always unnecessary, and not without drawbacks, in the cure of dacryo-cystitis.

M. ANTONELLI replied to M. Gorecki that pencils of chloride of zinc, being caustic and destructive, bore no resemblance to medicated styles. To M. Jocqs and M. Valude he replied that he did not claim for his styles that they could cure all cases of mucocele with swelling, though in several recent cases he had succeeded in reducing them. The slitting of the canaliculus, or rather the division of the internal palpebral ligament, was in order to spare pain to the patient, and its disadvantages were less than those of forcible probing.

New Form of Artificial Eye.—M. Antonelli then described and praised the new form of artificial eyeball introduced by Professor Snellen, and described by him in the OPHTHALMIC REVIEW for December, 1898.

A. H. THOMPSON.

COLLEGE OF PHYSICIANS OF PHILADELPHIA, SECTION OF OPHTHALMOLOGY.

Dr. GEORGE C. HARLAN, Chairman.

MEETING, MARCH 21, 1899.

Dr. John T. Carpenter, Jun., exhibited *A Patient with Bilateral Extensive Choroidal Hæmorrhage in the Macular Region.*—There was in each eye an extensive and nearly symmetrical area of atrophy of the retina and choroid, involving the foveæ. The cause was hæmorrhage, occurring in the left eye three years earlier than in the right, from no assignable general cause. There was in each eye absolute central scotoma. The refraction was myopia and astigmatism. The correction that the patient was wearing was an inaccurate one, and she was obliged to use her eyes continuously at the near point, and it is probable that their prolonged and trying use was a contributing factor in the causation of her condition.

Discussion.—Dr. S. D. Risley stated that the two most interesting points concerning this case were the opportunity that had been availed of for the study of the changes from hæmorrhage to atrophy of the fundus tissues, and the effect on myopic eyes of the use of badly fitted lenses.

Dr. James Thorington exhibited *A Patient with Congenital Coloboma of the Choroid and Iris in Both Eyes without Involvement of the Lenses.*—There was no family history of heredity of this anomaly of the eyes, of hare-lip, or of cleft palate. Each eye showed a large symmetrical cleft in the iris in its lower portion at an axis of 95°, and a broad coloboma of the choroid, extending from the ciliary body up to and embracing the lower half of the nerve, with pigmented edges and scattered areas of pigment, and supplied by a few cilio-retinal and one or two small retinal vessels. The charts of the visual fields were characteristic of the anomaly. No definite history of day-blindness was obtained. The refraction was mixed astigmatism; $V. = R. \frac{6}{50}, L. \frac{6}{15}$.

A study of the recorded cases shows that, while partial coloboma of the uveal tract is not uncommon, complete coloboma of the iris and choroid is rare, and it is in combination with the anomaly of the choroid that coloboma of the lenses occurs.

Dr. Thorington exhibited for Dr. Oliver two coloured illustrations, the first showing the external appearances of coloboma of the iris, the second of coloboma of the choroid. In the latter the vascular supply was entirely from cilio-retinal vessels.

Discussion.—Dr. de Schweinitz stated that he had seen 2 cases of coloboma of the choroid and 1 case of large coloboma of the optic nerve sheath unassociated with ocular defects elsewhere. Drs. Sweet, Carpenter, Risley, Ring, and Harlan also spoke of the various forms of coloboma presenting features similar to those of Dr. Thorington's patient.

Dr. S. D. Risley presented *A Patient Showing the late Result in a Case of Implantation of Sponge in the Orbit after Enucleation.*—The operation had been performed in June, 1898, nine months before. There was no longer present any evidence of the sponge. Three months after the operation the orbit was well filled with new tissues, but during the succeeding six months this had been absorbed. A good and freely moving stump had been secured, but not better than is often seen after a careful excision.

Discussion.—Dr. Harlan said that at a recent meeting of the Ophthalmological Society of Paris, Valude had reported a case in which a stump formed by implantation of sponge in Tenon's capsule had shrunk to one-third of its original size in one year. The consensus of the opinion of the meeting was that sponge implantation after enucleation had been tried and found wanting.

Dr. Risley presented a brief paper on *The Employment of the Kalt Suture in Critical Cases of Cataract Extraction.*—The histories of three cases of cataract with tremulous iris and ruptured suspensory ligament were reviewed, in each of which the stitch had been introduced before making the corneal section. The vitreous in every case presented as soon as the section was completed, and the lens was extracted in the capsule by aid of the wire loop. Traction was then made upon the ends of the suture until the loop in the stitch was exhausted and the lips of the wound caused to approximate. Under this manipulation the vitreous was returned within the eye, completely in two cases, and all but a small bead at the outer angle of the wound in the third. Recovery was rapid and normal in each case. Dr. Risley believed that the procedure was, in cases where loss of vitreous was imminent, a very useful one.

Discussion.—Dr. Chas. A. Oliver had used the Kalt stitch in a case of traumatic irido-cyclitis and cataract. During the extraction of the right lens under cocaine a large bead of vitreous presented through the corneal incision. The stitch was introduced, the edges of the cut approximated, and the vitreous mass receded. The suture was then tied. The stitch came out on the fourth day, leaving a firm wound.

Dr. Risley gave briefly the history of *Recurrent Rheumatic Iritis* of a severe type occurring in a man, aged 35, with compound myopic astigmatism, in whom recovery had been secured, after repeated attacks, with normal acuity of vision, and without any increase in the myopia. After recovery from the last attack it was noted that a segment of the iris below did not react. The pupil was perfectly round when dilated, but after the influence of the mydriatic had disappeared was pear-shaped. Dr. Risley thought the condition was explained, not by a paralysis of the iris fibres, but by an adhesion between the capsule and posterior surface of the iris, too far back to be demonstrated, but sufficient to prevent expansion or contraction of the segment involved.

Dr. G. E. de Schweinitz presented the history of *A Case of Fistula of the Orbit due to Caries of the Lacrymal Division of the Ethmoidal Cells*, and described the operative procedures performed by himself and Dr. Walter J. Freeman for its cure.

Discussion.—Dr. Zentmayer related a case of Dr. Wm. F. Norris, in which the operation consisted of crushing through the ethmoidal bone from the orbit. The result was the permanent cure of the fistula. Dr. Harlan referred to the case of a boy, 9 years of age, in which an epiphora of the right eye of some months' duration was followed by the appearance of a bony swelling the size of a split pea, above and slightly posterior to the lacrymal sac. The nose had been badly broken six years before, the septum deviated to the right side, and the nares obstructed. After incision, several drachms of a black fluid escaped from a cavity with smooth walls, apparently lined with mucous membrane which did not communicate with frontal or ethmoidal cells. There was rapid cure, without deformity, and with complete disappearance of the epiphora. Dr. Carpenter referred to a case of fracture of inner wall of orbit with closure of lacrymal duct, in which drainage into nose and prolonged probing failed to cure. Rhinological examination showed disease of ethmoid cells, but patient passed from under observation.

Dr. Wm. Zentmayer showed *A Case of Tumour of the Orbit with Secondary Involvement of the Lymphatics* in a child, aged 5 years. Six weeks earlier a bloody tumour over the right parietal bone had been incised and tapped. There was protrusion of the right eye, but no cerebral symptoms. The skull was enlarged, the sutures and fontanelles open, and the veins of the forehead and lids dilated. The enlargement of the lymphatics was most marked in the right cervical chain. Knee-jerk diminished on the left side. Examination of the blood showed intense secondary anæmia. The right eye was proptosed 1 cm., and could not be replaced. The outward movement was abolished, and the upward limited. Pupils normal. In the right eye there was choked disc, with minute hæmorrhages and marked striations of the retina in the macular region, and in the left eye optic neuritis.

Dr. G. C. Harlan, in a paper entitled *Abscission and Combined Keratectomy*, urged the more frequent performance of abscission of the cornea as a substitute for enucleation of the eye when the disease or injury is confined to the anterior segment of the ball. This operation was formerly done with entirely satisfactory results in many cases which to-day would be submitted to enucleation, with the result of unnecessory deformity and annoyance. Panas' "combined keratectomy" differs from the Critchett operation chiefly in placing the incisions and sutures in front of the ciliary body instead of behind it, and seems to be an improvement over former methods. The application of this procedure to cases of painful absolute glaucoma is an important advance.

Dr. Harlan also showed *A Patient in whom a High Degree of Myopia had Developed without Changes in the Fundus.*—She was examined under complete mydriasis fourteen years ago, at 15 years of age, and had hyperopia of 0·25 in the right eye. Whereas, now, $\frac{20}{20}$ in that eye, under mydriasis, with —2·75 s., —0·25 c., Ax. 60°, and a perfectly normal fundus. The left eye had a high degree of myopic astigmatism at the time of the first examination and has since become divergent.

Dr. H. F. Hansell described *A Case of Atypical Retinitis Pigmentosa in a Child of* 10.—The pathological changes were gradual absorption of areas of the retina and choroid at varying distances from the papilla, and an incipient atrophy of both optic nerves. He believed that the case was in the early stages of the disease recently described by Fuchs, namely, atrophia gyrata choroideæ et retinæ, the characteristic features of which are gradual disappearance of normal retina and choroid in patches arranged in concentric circles with the papilla as the centre, and connected by islands of normal structures, and associated with advancing atrophy of the optic nerves.

Dr. Chas. A. Oliver gave a brief report and exhibited sketches of *A Case of Fibroma of the Eyelid* (painful subcutaneous tubercle of Wood).

HOWARD F. HANSELL,
Clerk of Section.

THE STEREOSCOPE AS A TEST FOR INEFFICIENCY OF THE OCULAR MUSCLES.[1]

BY GEORGE J. BULL, M.D., PARIS.

IN the examination of cases of inefficiency of the ocular muscles it is important to determine the degree of ease or difficulty with which binocular single vision is attained.

For this purpose the Holmes Stereoscope is a useful instrument. The following extract from an unpublished letter written by Dr. Oliver Wendell Holmes serves to describe the instrument and is not without historical interest: "All I had to do with the stereoscope," he writes, "was in the way of contrivance rather than of invention. Finding the common box stereoscope heavy and awkward, I mounted the lenses, fastened them to a thin slat, cut some slots or grooves in it to hold the pictures, put a hood round the glasses fitted to my own forehead, stuck a common brad-awl underneath for a handle, and there was my stereoscope." Dr. Holmes adds that a workman afterwards suggested the sliding holder which made the instrument more convenient.

The first use I made of the stereoscope during the period of my association with Dr. Javal was to effect by practical exercises the re-establishment of binocular single vision in patients who had lost it.

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[1] Read in the Section of Ophthalmology of the British Medical Association, Portsmouth, August, 1899.

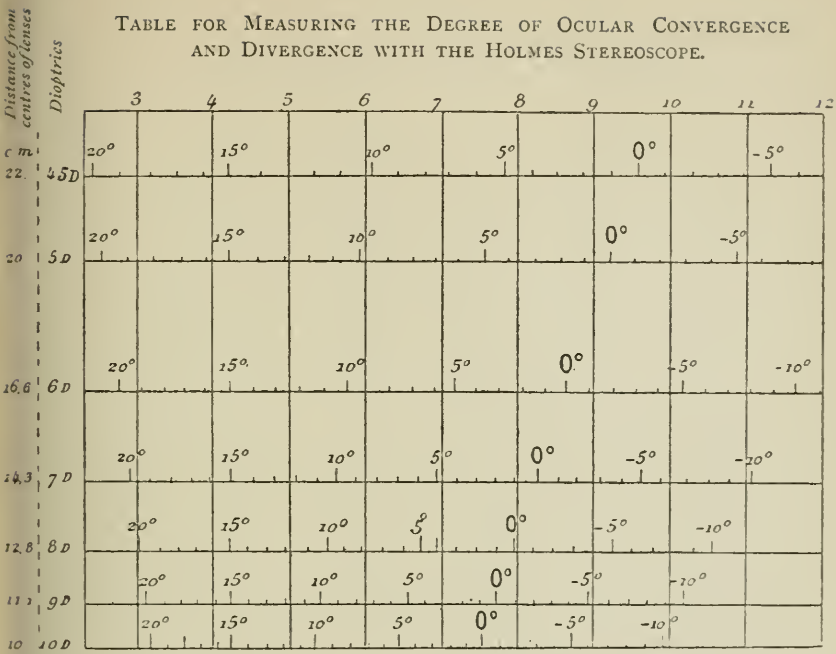
It occurred to me afterwards that the instrument would be useful also in cases of muscular inefficiency, not only to develop binocular vision by practice, but also by way of diagnosis to determine the amplitude of fusion. For this purpose I made a scale to measure the angle of convergence of the visual axes when the test-cards are properly seen at any distance.

The cards I prefer have each two circular discs as test-objects, one for the right eye and one for the left. Above the right disc is a small dot or cross which I call a controller, and below the left disc is a similar controller. When the discs are properly fused by the patient he sees but a single disc with a controller above and another below. The controllers serve then to assure us that the single disc observed is the composite or fused image seen by the two eyes working together, and they make the stereoscopic test superior in this respect to tests of fusion in which the two eyes look at a single object.

The rod upon which the card holder slides is marked in diopters measured from the centres of the lenses. Each card bears a number indicating in centimetres the distance between the two discs.

Now as the degree of convergence required for fusion of the discs varies with the number of the card and its distance from the lenses, it was necessary to make a scale to show the degree in every case. My scale is made on the basis that the stereoscope has lenses of 6 D., the centres of which are 86 millimetres apart, that the centres of rotation of the patient's eyes are 65 millimetres behind the lenses, and that his interpupillary distance is 60 millimetres. If the interpupillary distance is greater or less than this it is easy to calculate the modification to be made in the scale, but for patients generally the angles of convergence shown by the scale are approximately correct.

TABLE FOR MEASURING THE DEGREE OF OCULAR CONVERGENCE AND DIVERGENCE WITH THE HOLMES STEREOSCOPE.



Each figure on the upper line of the scale indicates the card bearing the corresponding number, and the line descending from this figure shows by its position on every scale below the degree of convergence required for fusion of the discs of the card at the distance indicated.

To the left of the zero of each scale the figures indicate degrees of convergence; to the right they indicate degrees of divergence.

Example: When a patient fuses the discs of No. 8 card at 7 D. (14·3 cm.) he is converging 1°.

It is shown by the table that the Holmes stereoscope, with test-cards numbered from 3 to 12, enables us to measure an amplitude of fusion of 30°, namely, one extending from 20° of convergence to 10° of divergence. We seldom need to measure so high a degree of divergence; but it often happens that we wish to determine whether the patient can converge more than 20° while fusing such test-cards. For this purpose I have recourse to another instrument called the "Stereoscope for exercises with crossed axes," or simply the "Cross Stereoscope." This is a Holmes stereoscope without lenses or prisms in which the patient looks through a diaphragm so placed that his right eye can see only the disc on the left side of the test-card, and his left eye can see only the disc on the right. In using the "cross stereoscope" I ask the observer to look through the diaphragm at a pencil which I bring nearer and nearer till it is about half way between his eyes and the test-card. At that moment, if he is seeing the pencil single, he will observe that the discs of the test-card come together in fusion. His statement as to the position of the controllers assures me he is seeing the card properly. Removing the pencil, I observe whether the patient can continue to see this card properly. If he does so, I move the card nearer till I find the nearest point at which he can fuse the discs. In this way it is possible to measure convergence of 40°, which is quite sufficient for practical purposes. The degrees are marked on the rod which carries the card holder.

The advantage of the Holmes stereoscope[1] over other tests is that you conduct the examination not under unnatural and bewildering circumstances, as in the case of tests with prisms in looking at a candle flame, with or without a coloured glass, but under circumstances closely analogous to the ordinary use of the eyes in reading or writing. Consequently you are able to follow with comparative ease and certainty, and without much danger of error by reason of subjective mistakes of the patient, exactly what happens to the patient's eyes in the effort to conduct the ordinary occupations of life.

A single instance will suffice to show the advantages which result from the method described. In a case shown by the Maddox rods to be one of exophoria with slight hyperphoria, the stereoscopic tests showed that fusion could be maintained for but a few seconds, and only under low degrees of convergence. The exophoria might have led me to expect to find an increased facility of fusion when the visual axes were parallel or divergent ; but the stereoscopic method proved, on the contrary, that when the test-card required parallelism or slight divergence fusion seemed to be impossible. The eyes first converged a little too much and then went into a spasm of divergence. When the eyes diverged excessively, and under these conditions only, the controllers showed that the left eye became lower than the right.

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[1] The test cards and Holmes stereoscopes, provided with well-centred lenses, are to be found at E. B. Meyrowitz, the optician's, 3, Rue Scribe, Paris, and 23rd Street, New York.

The Maddox rods had already indicated hyperphoria, but the stereoscopic method enabled me to determine with precision the exact circumstances under which the hyperphoria occurred. The inference in this particular case was that the hyperphoria depended on the divergence, and not the divergence on the hyperphoria, from which it followed that an operation for hyperphoria was not indicated.

The observation already referred to indicating spasm of the externi directed my attention to the importance in the case in question of spasmodic conditions resulting from the muscular inefficiency, and I was able by following out the line of observations thus opened up to satisfy myself that a whole range of complex and obscure conditions in the patient's state amounting almost to a general neurasthenia were nothing but the outcome and development of ocular spasm and could be, as in fact they were, entirely removed by an appropriate tenotomy.

VIEUSSE (Toulouse). Orbital Complications of Empyæma of the Ethmoidal Cells. *Recueil d' Ophthalmologie, March, April, and May*, 1899.

These three articles contain probably the most complete account of this subject which has yet been written. The first one opens with an account of the anatomy of the ethmoidal labyrinth. Fourteen cases are then described, and from a practical point of view a perusal of these is likely to be of more use to the surgeon than the general account of the symptoms which follows in the second article.

In the first (the author's own) case there was a fluctuating tumour at the inner angle of the eye which was displaced downwards and outwards, and slightly forwards. The eyelids were swollen in their inner thirds and the left nostril stopped up. Diplopia existed and vision was reduced to $\frac{1}{5}$. An incision revealed that the tumour was composed of caseous tuberculous matter, and that almost the whole of the inner wall of the orbit was destroyed, so that the finger could be introduced from the orbit into the nasal fossa. As much as possible of the caseous material was removed with a curette. Subsequently intra-nasal treatment was adopted, and a fortnight later a cure had been effected with restoration of normal vision.

The second case was that of a young man, aged 20, with slight proptosis and displacement outwards of his left eye of four years' duration, without any other symptoms except frequent coryza and lachrymation. Only five days before his appearance at the hospital a swelling had been noticed on the inner side of the eye. At the same time there was muco-purulent discharge, and two days later, constant dull pain at the level of the malar bone. At this time the eye appeared to get suddenly bigger and nearly blind; the next day there was much œdema and intense headache; sight then improved but the pain continued. On admission the eye was found to be proptosed and displaced downwards and outwards. There was no restriction of movement, and no diplopia. Vision $\frac{1}{3}$. Nothing abnormal in the fundus except some enlargement of veins. The globe and conjunctiva were red, especially on the inner side, and there was a slight muco-purulent discharge. The eye was tender to pressure, and with the finger at the upper and inner angle of the orbit a small hard lump could be felt separated from the orbital margin by a slight cleft into which the finger nail could be introduced. There was no swelling in the region of the frontal sinus, and at the time no coryza, but pain could be elicited on blowing the nose. In this case the rapidity with which pain, œdema and proptosis were developed pointed at first to the diagnosis of acute tenonitis, but this was inconsistent with the direction of displacement and with the tumour. Empyema of the maxillary antrum was definitely excluded by intra-buccal illumination. Strange to say, a thorough examination of the nasal fossæ by a skilled rhinologist revealed absolutely nothing abnormal, so that there seemed nothing to point to disease either of the frontal or the ethmoidal sinuses. After a few days, the œdema of the lids nearly disappeared, the proptosis also ceased, but the deviation down and out remained. The proptosis therefore was no doubt due to effusion of serum within the capsule of Tenon, which was absorbed at the same time as that in the subcutaneous tissue. This only made the tumour at the upper and inner angle of the orbit more unmistakable, and the idea of exostosis or osteo-sarcoma seemed probable. The diagnosis was only cleared up by operation. An incision was made from the inner angle of the orbit for 5 centimetres along the upper orbital ridge, and a dissection made down on to the tumour. A characteristic parchment-like crepitation could now be felt. On incising the tumour with a sharp curette a milky gelatinous fluid escaped, and on introducing the finger into the cavity its limits could not be felt. Irrigation with tepid boric solution brought away a large quantity of greyish mucus but no pus. A drainage tube was introduced and dry iodoform dressing applied. At subsequent irrigations the discharge was muco-purulent. Nearly normal vision was regained, but the subsequent history of the case is not recorded.

In the other cases reported the following are the most noteworthy points :—

Case 4.—The disease started in the maxillary sinus, from decayed teeth. It spread to the frontal sinus, but surgical treatment of both these cavities led to no permanent cure. Two years after the commencement of the disease a tumour, the size of a large hazel-nut, was observed at the internal angle of the eye, without pain or tenderness. On practising anterior rhinoscopy, after cleansing the middle meatus, pressure on the tumour from the orbit so as to diminish its volume occasioned an obvious escape of pus from the middle meatus.

Cases 5, 6 and 13.—In all these cases an abscess at the internal angle of the eye appeared in children under nine, leading to a fistulous opening at the supero-internal angle of the orbit. These cases show that disease of the internal wall of the orbit may occur before either the frontal or ethmoidal sinuses are anything more than rudimentary.

In *Case* 11, two weeks after the operation of curetting the abscess cavity from the orbit, a fatal meningitis ensued.

In the second article the symptoms are reviewed methodically. The starting point of all orbital symptoms is probably always the destruction of the os planum of the ethmoid bone, for there is no evidence and no analogy to show that the veins can constitute the channel of infection. This involves the invasion of the orbit by the inflammatory products, swelling of the lids, exopthalmos and the appearance of a tumour at the internal angle of the eye. The tumour may be diffuse or circumscribed, round or irregular, the size of a pea, a hazel-nut, or even larger. It is as a rule painless ; it is soft, fluctuating and depressible, while sometimes pressure on it may give rise to discharge from the nostril, or crepitation may be felt. The tumour may be an abscess which discharges externally, leaving a fistulous opening. The proptosis may be obvious or only slight. The displacement is generally downwards and outwards. Movements are scarcely impaired. The œdema may be localised in the inner third of the two lids, may be confined to the upper lid, or may be diffused over both. There may or may not be diplopia. Visual acuity may fall to $\frac{1}{5}$ when the optic nerve is compressed and subsequently return to normal. Ophthalmoscopically there may be a woolly disc, small arteries, dilated veins, retinal œdema or opacities in the vitreous. The disease seems to occur more often on the left side (10 out of 14 cases).

The varieties of the disease are then classified into acute and chronic, and again into "open," with discharge into the nose, and "closed," without any vent; and again into disease of the anterior cells with discharge into the middle meatus, and disease of the posterior cells with discharge into the superior meatus. The "necrosing ethmoiditis" of Woakes and the controversy among rhinologists to which it has given rise are also touched upon.

The third article begins with a discussion of the ætiology, and here the various forms of rhinitis naturally occupy the first place. It may, however, be a sequel of almost any of the general infectious diseases—including, of course, tubercle and syphilis.

Diagnosis and Prognosis.—At a late period, disease of the frontal, sphenoidal, maxillary and ethmoidal sinuses are apt each to be complicated by extension to one or more of the others, but at an early period it ought, one would think, to be possible to make a diagnosis between them. The case that presents most difficulty is the diagnosis between frontal and ethmoidal disease. The chief points are the following:—

(1) The localisation of the pain and tenderness over the frontal sinus may give some help.

(2) A projection of the bony wall into the orbit occurs far more readily in the case of ethmoidal than in that of frontal disease.

In the latter, perforation more readily occurs with formation of an abscess, as it were suspended from the orbital roof, giving rise sometimes to a cutaneous fistula which invariably opens in the orbito-palpebral furrow (Panas).

(3) The symptoms due to compression of the eyeball are the same in the two cases.

(4) On nasal examination, pus in the middle meatus may come from either the maxillary, the frontal, or the anterior ethmoidal cells, pus in the superior meatus from the posterior ethmoidal or sphenoidal sinuses. To diagnose between the former, catheterisation of the frontal and (after puncture) of the maxillary sinuses may be employed. If in each case pus reappears immediately after irrigation is employed, there is great probability that it comes from the ethmoidal cells. On the other hand the possibility exists that the surgeon who thinks he has introduced his catheter into the frontal sinus may in reality have perforated the thin anterior wall of an ethmoidal cell.

(5) It is claimed by Ruault that trans-illumination may reveal that the anterior ethmoidal cells are more opaque on one side than on the other.

(6) In the case of frontal disease, auscultation over the sinus may discover expiratory râles.

It must, we think, be admitted that none of these signs are likely to be at all decisive, so that the diagnosis between frontal and ethmoidal disease must often remain a mere conjecture. That this may remain so, even after operation, is an opinion which will only be strengthened by a perusal of the cases in the first of these articles.

The diagnosis between empyæma of the anterior and that of the posterior ethmoidal cells might certainly be made in any case where the pus in the nose could be localised in either the middle or the superior meatus, but there is no instance here quoted in which this has actually been done.

The diagnosis between disease of the posterior ethmoidal cells and the sphenoidal sinus must be even more difficult, though the early occurrence of compression of the optic nerve would be in favour of the latter.

Perhaps the case of most practical importance is the differential diagnosis from dacryocystitis. Happily this should not often present much difficulty, though mistakes have been made. Malignant tumours in this situation are exceedingly rare, but must of course be borne in mind as must also the more frequent occurrence of osteomata.

In the prognosis, while the disease is still uncured the proximity of the other sinuses and the possibility of meningitis must be remembered. When once the internal wall of the orbit has been destroyed, even after an apparent cure, an easy channel for reinfection from the nose remains open.

Of the treatment of this affection little can be said that is not obvious. Some authôrities recommend that it shall be attacked from the orbit, others from the nose. The sensible plan is obviously to adopt either or both these courses, according to the necessities of each particular case. With regard to the orbital procedure, surgeons differ as to whether the incision should be along the upper, the internal, or the internal and inferior margins of the orbit. The operation is thus described by Grüning :—

(1) Incision along the internal margin of the orbit down to the periosteum.

(2) Stripping up of the periosteum internal to the lachrymal sac. Division of the attachment of Horner's muscle, and laying bare of the os planum.

(3) Pressing the orbital contents to the outer side with a spatula.

(4) Curettage of the os planum.

(5) Introduction of a drainage tube from the orbit into the nose and suture of the incision.

A. H. Thompson.

F. SEYDEL (Breslau). A Contribution to our knowledge of Keratitis Neuro-Paralytica. (*From the University Clinique, Breslau*), *Arch. f. Ophthal.*, *Bd. xlviii.*, *Abth.* I.

In Seydel's careful, but unduly long paper, we find the record of a case of neuro-paralytic keratitis, in a child with paralysis of the trigeminal nerve, under the writer's observation, and a discussion of the various theories regarding the nature and cause of the corneal disease. From the evidence obtained in the cases he has seen, and facts recorded in previously published cases, Seydel concludes that the most satisfactory explanation of keratitis neuro-paralytica is that it is due to trophic disturbance. This is the theory originally propounded by Magendie, as the outcome of experimental work. Most authors who support this view assume that the trigeminal nerve contains trophic as well as sensory fibres; Seydel, however, considers this assumption unnecessary, and suggests that the nutritional disturbance may be sufficiently accounted for by vaso-motor paralysis; the interference with the nutritive supply becoming of primary importance in consequence of the loss of sensibility in the cornea. The lack of anatomical evidence of the existence of different sets of fibres in the nerve, which has often been advanced as an argument against the trophic theory, is, according to the writer's views, of no moment. It is, Seydel thinks, a matter for surprise that the nature and origin of keratitis neuro-paralytica has not been finally determined. A considerable number of clinical and experimental observations have been made and recorded since Magendie's investigations were published.

On examination of the clinical records, Seydel found that nearly all the published cases of trigeminal paralysis were complicated by affection of other cranial nerves, and he mentions four uncomplicated cases, reported by Müller, Archer, Ferrier and Ad. Schmidt. To these he adds his own case, although as it occurred in a child aged 13 months, complete investigation was rendered very difficult.

The description of his patient is briefly as follows: a weakly strumous child, whose right eye had been affected for eight days. R. cornea grey and opaque, except a narrow peripheral ring; centre yellowish; surface uneven and in places devoid of epithelium; large hypopyon. No photophobia or lacrimation. Cornea insensitive. Well marked ptosis. Loss of sensation over whole area of distribution of right trigeminal nerve. Face asymmetrical, right half softer than left; atrophy of masticatory muscles on right side. The skin of right half of face was slightly more vascular than that of left, and redness after irritation came on more slowly and less intensely. On right half of lower lip and side of tongue was an ulcer with infiltrated margins.

The mother died of pulmonary phthisis soon after the birth of the child. A brother of the patient had been under care for strumous keratitis. The right cornea became perforated, and then healed without adhesion of iris; the ulcer of mouth also healed. Seydel diagnosed a tubercular lesion affecting the Gasserian ganglion, as the probable cause of the paralysis.

Seydel draws special attention to the evidence, in his patient, of partial paralysis of the sympathetic on the same side as the trigeminal palsy; and with these facts before him, he investigated two other cases in patients operated upon by Mikulicz. In both these cases resection of the Gasserian ganglion had been done, and in both a neuro-paralytic keratitis ensued. In one, the operation was followed by exaggeration of a pre-existing ptosis and marked recession of the eyeball, the pupil became contracted and its reaction to cocain was completely lost. In the other case, the operation gave rise to noticeable sinking of the eyeball and narrowing of the palpebral fissure.

In studying the records of clinical and experimental observations, Seydel finds that in no inconsiderable proportion of the cases reference is made to one or several signs of paralysis of the sympathetic, although little attention was frequently paid to these signs, and they were not always attributed to interference with the sympathetic.

Seydel reviews the arguments advanced in favour of and against the different theories as to the true nature of neuro-paralytic keratitis, dealing especially with the traumatic theory, which was so strongly supported by Snellen and Senftleben; he sets forth clearly the facts and deductions therefrom which prevent his acceptance of their views, and for which the reader is referred to the original.

His final statement is that keratitis neuro-paralytica is a trophic lesion, induced by loss of sensation in the cornea, and vaso-motor disturbance due to paralysis of the sympathetic. Each of these conditions is an important factor, and Seydel is of opinion that the combination is necessary for the occurrence of this form of keratitis. If the vaso-motor disturbance were in itself sufficient cause, every case of paralysis of cervical sympathetic would develop corneal lesions. He was unable to find any record of such a case.

He suggests in explanation, that in paralysis of the cervical sympathetic, in spite of the vascular disturbance there is a sufficient nutritive supply for the very small amount of tissue change which occurs in the cornea. If, however, the corneal sensibility is lost by paralysis of the trigeminus, the action of outside influences leads to much more tissue change; greater or less destruction of tissue must result from the damage by external irritants, and for these increased tissue changes the diminished nutritive supply (resulting from vaso-motor disturbance) is insufficient.

Seydel thinks that neuro-paralytic keratitis may be justly compared to the neuro-tropic lesions met within spinal cord paralysis, and the perforating ulcer of the foot occurring chiefly in cases of tabes dorsalis.

The writer promises to publish experimental evidence of his views in a subsequent article.

J. B. L.

JONNESCO (Bucharest). Resection of the Sympathetic in the Treatment of Glaucoma. *Wiener Klinische Wochenschrift, xviii.*, 1899.

Since his first attempt at the cure of glaucoma by resection of the cervical sympathetic in September, Jonnesco has operated eight times, the results accruing in which cases he briefly relates at the outset of a paper on the subject. Into the details it is not necessary to enter here, but the cases are thus summarised by the author: one of acute glaucoma, one of chronic irritable glaucoma, three of chronic glaucoma absolutum with irritation, and three of glaucoma simplex. The results following upon operation are thus grouped by him also: (*a*) in every instance immediate and lasting reduction of the tension of the eye; (*b*) marked contraction of the pupil, which was also permanent; (*c*) disappearance of the accompanying headache; (*d*) cessation of exacerbations; (*e*) noteworthy and lasting improvement in vision in all the examples in which retention of light perception or vision indicated that the process had not gone on to atrophy of the optic nerve. This improvement in sight was very remarkable by reason of its immediate occurrence and its constant advance, particularly in one or two of the cases, but it did not occur at all in two of the cases of glaucoma absolutum, nor in that of acute glaucoma.

Turning to the general question he quotes Panas and Duvigneaud as saying that only when the nervous mechanism of intra-ocular secretion, that is, the action of the nervous system upon intra-ocular tension, has been elucidated, can the pathology of glaucoma be fully explained, the action of iridectomy understood, and the treatment of the disease—possibly by some different methods from those at present in vogue—be placed upon a thoroughly scientific basis. Donders regarded the fifth nerve as the probable offender, bringing about an increased secretion; according to him section of the fifth nerve caused reduction of tension, while section of the sympathetic had no influence; but these opinions have been shown to be incorrect by Wegner, who proved that the fifth nerve has no influence on tension, while section of the cervical sympathetic brings about its reduction. This reduction takes place in spite of the fact that there is dilatation of the intra-ocular vessels, because the lowering of the blood pressure causes a diminution of the secretions into the eye. Adamück ascribed the increase of tension, which he observed to come on when the cervical sympathetic is stimulated, and which is but temporary, to contraction of the vessels of the head ; the teaching of von Hippel and others is that the stimulation of the sympathetic causes active contraction of the unstriped muscle of the orbit, the vessels being thus constricted at their point of emergence from the globe, the intra-ocular tension is bound to rise in spite of the reducing effect of the constricting action upon the ocular vessels. Be that as it may, clinical evidence goes to show that in the sympathetic trunk there are fibres whose stimulation, whether constant or intermittent, whether central or peripheral, is capable of giving origin to the following symptoms:—dilatation of the pupil, contraction of the small intra-ocular vessels, energetic contraction of the peri-bulbar unstriped muscular apparatus, and probably increased activity of the secreting mechanism for the aqueous humour, thus bringing about increased inflow into the eye at the same moment that the means of outflow are diminished—in other words, glaucoma. One has only to imagine that these fibres are permanently or intermittently overactive; if so there exists a permanent or intermittent rise in the blood pressure ; the result is increased intra-ocular effusion of fluid, and the enlarged pupil forcing the iris into the angle of the anterior chamber, we have diminished escape of fluid, while at the same time the contraction of the unstriped muscle round the globe, by pressing upon the large efferent veins, still further hinders the exit of effete matter from the eye. Removal of the superior cervical ganglion destroys all the vessel-contracting mechanism of the eye, blood pressure at once sinking and extravasation from vessels diminishing ; it destroys the excitory nerve mechanism of secretion, so that there is less formation of aqueous humour; it destroys, too, the pupil-dilating fibres, so that there is myosis; the angle of the anterior chamber remains free and the route of exit patent; lastly, it destroys the innervating fibres of the unstriped muscle round the globe, which, by its contraction, assists to render the exit narrow and difficult. These are the grounds, then, upon which Jonnesco considers removal of the superior cervical ganglion indicated, at all events in certain cases of glaucoma. On the question, Where is the original seat of the damage to nerve balance which leads to glaucoma? his view is that it is central and not peripheral, that there is an irritation of encephalic or medullary centres from which fibres run to the sympathetic. If so, then, though removal of the superior cervical ganglion does not remove the *fons et origo mali*, it yet effectually and permanently shuts off the route by which evil comes. It is obvious that it will chiefly be in those forms of glaucoma in which the nervous element is strongest that most good is likely to be obtained from this somewhat heroic mode of treatment; it is thus seen that the most favourable cases are those of glaucoma simplex and chronic irritative glaucoma, while all those forms in which acute exacerbations are an important feature are less amenable. That is, Jonnesco's operation is suitable just for cases of the class in which iridectomy is of least value, and *vice versâ*. Without entering into details of the operation itself, we may say that the author, who considers mere division of the sympathetic trunk to be of very small value indeed as a substitute for resection, finds fifteen minutes sufficient time for the bilateral operation; after it is completed there are observed congestion of the face, eyes, and nose, lachrymation, and headache, all which symptoms disappear in about a day's time, but there remain permanently contraction of the pupil, sinking of the globe into the orbit, a slight degree of ptosis, and narrowing of the palpebral aperture. As regards the visual condition, there is at once an improvement in the patient's sight, which goes on increasing day by day, and at the same time the circumorbital pains and the headache vanish, after the immediate effect on the cerebral circulation produced by the loss of the ganglion has passed away; occasionally there is slight dysphagia. One of Jonnesco's cases was a patient who suffered both from glaucoma and from exophthalmic goitre; both conditions were cured by the one operation.

E. FUCHS (Vienna). Text-Book of Ophthalmology. *Second American Edition. Translated by Dr. A. Duane (New York). London: H. K. Lewis*, 1899.

During the seven years that have elapsed since the publication of Dr. Duane's translation of Professor Fuchs's work, the book has passed through several editions, and has become increasingly popular. We gladly welcome a second edition in the English tongue, and congratulate the translator upon the result of his labours.

Those who have watched the appearance of the succeeding German editions will be prepared to find that the volume before us is in many respects altered from that which appeared in 1892 [OPHTHALMIC REVIEW, 1893, p. 55]. As stated in the translator's preface, "alterations will be found on almost every page." The most noticeable are in the chapters on "Diseases of the Conjunctiva, and of the Cornea," and in the sections dealing with disease of the fundus. A large number of illustrations have been added, and some of the recent ones are most excellent; they are not only well done, but well chosen and show how thoroughly Professor Fuchs appreciates the wants of students.

While it is probably true that a good book always suffers more or less in translation, we think both author and translator in this case may be very well satisfied. The work is one which we can warmly commend, as an excellent and trustworthy guide to the science of ophthalmology of the present day. From a literary point of view the present edition seems to us to be a distinct advance upon Dr. Duane's former translation.

CLINICAL NOTES.

SYMPATHETIC OPHTHALMIA FOLLOWING TATTOOING OF THE CORNEA.—The circumstance here recorded is not unique, for such cases have been seen before now, but it is sufficiently curious, and at the same time points a useful moral. A young man consulted Trousseau regarding a somewhat extensive leucoma of the right cornea, which, however, permitted vision of $\frac{1}{10}$; it dated from an attack of ophthalmia neonatorum. He had been told that tattooing would take from the unpleasing appearance, but wished further advice before submitting to this. Trousseau, for several reasons, but chiefly on the ground of the incorporation of the iris in the scar, decidedly advised him to leave the eye untouched; it was at that time quite free from irritation. However, the patient did not take this advice, but had himself tattooed, the immediate effect of which was a violent irido-cyclitis, on account of which he returned to Trousseau. For two months the eye remained painful and irritable, and its removal was recommended, but refused. He disappeared for some weeks, and then returned with typical sympathetic ophthalmia in the left eye, and quite blind; in spite of all treatment he remained so. Trousseau recalls a case in which he saw sympathetic ophthalmia follow tattooing for a simple corneal opacity without adhesion of the iris, and says that one is apt to think too lightly of this operation; some eyes bear it very badly. We agree with him that it should not be performed when the iris is included in the opacity.—*Annales d'Oculistique*, March, 1899.

Sympathectomy in Glaucoma.—Demicheri, of Monte Video, reports two cases in which he has obtained good results by this heroic mode of treatment. Most surgeons have, as he truly says, experienced misfortune some time or other in treating by iridectomy those cases of glaucoma in which the field of vision is much restricted; it was in instances of this class that he employed sympathectomy. The first of these patients was a prematurely old woman of 38, with rigid vessels, whose left eye had been operated upon for glaucoma without benefit some six years previously, and about three years after that the right eye had also been iridectomised, but symptoms had persisted, and the eye was getting worse; the classical signs of glaucoma were all present. Persistent instillations of eserine failing to give relief, Demicheri's colleague, Lamas, at his request resected the cervical sympathetic on each side, removing the superior and inferior ganglia; the middle ganglion was not present. Immediate improvement in vision and tension occurred, and under the use of eserine was maintained. From being $\begin{array}{ccc}15 & 10 & 35\\ 22 & \times & 55\\ 30 & 55 & 57\end{array}$ the field of the left eye became $\begin{array}{ccc}57 & 45 & 57\\ 55 & \times & 68\\ 50 & 70 & 70\end{array}$ while the improvement of that of the right eye, though less, was quite decided. His second patient was a woman of 81, who only attained hand movements in the left eye, and could count fingers at 1 m. with the right. Ten days after resection of the left sympathetic, vision of the right eye rose to $\frac{2}{3}$, the pupil being contracted, the tension lowered, and a slight degree of ptosis being present. These signs of improvement were found to be maintained when the patient was seen two months later. The third patient was a woman of 70, whose left eye had been enucleated on account of absolute glaucoma; she refused any treatment other than eserine, but after some violent mental excitement, she found herself almost blind from acute glaucoma, and returned, submitting to iridectomy. Vision rose to $\frac{1}{50}$, but failed again; after sclerotomy, so long as she continued to use eserine, this amount of sight was maintained, but this was neglected, and she was found to have lost central fixation, the field also being much reduced. The right cervical sympathetic was resected, with the result that vision rose to $\frac{1}{30}$, and the field expanded to double its former dimensions. It will be observed that in the first and third of these cases the patients had arrived at the stage of glaucoma in which there is permanent retention of excretion more or less complete. Whatever view of the pathology of glaucoma one may adopt, yet tension was reduced. Does not this point to the effect of the operation having been to reduce the secretion of fluid in the eye?—*Annales d'Oculistique*, March, 1899.

SCHWARZ (Vienna). CILIA IN THE ANTERIOR CHAMBER.—One would have thought that cilia once introduced into the anterior chamber could not have been tolerated, but Schwarz records a curious exception to this rule. A splinter of iron struck the cornea of a patient, and as it cut through the coats of the eye, it carried with it an eye-lash; the eye remained quite quiet for twelve years, and only then began to be troublesome, the patient complaining of a little uneasiness. The eye-lash was lying with one end caught in the corneal wound, the other, thicker, end lay on the corneal margin; there was a slight degree of lens opacity. Possibly the cilium had begun to cause annoyance by getting into such a position as to "tickle" the iris; it seemed also possible that the irritation had nothing to do with the presence of the eye-lash. Schwarz had come to no definite conclusion by the time of writing.—*Münchener Medicinische Wochenschrift*, March 14, 1899.

A TRACHOMA SCHOOL.—A few months ago there was opened by the city authorities in Milan a school for children afflicted with granular conjunctivitis. The school is an annex of the Ophthalmic Institute, and comprises two rooms, each of which can accommodate fifty pupils. At the present time the total number of children in the school is sixty. When lessons are over the children go to the institute to be treated, and only after treatment are they allowed to go home.—*New York Medical Record*, March 18, 1899.

URTICARIA AND EYE-STRAIN.—Dr. Oliver, of Philadelphia, relates a singular case of apparent cure of persistent urticaria by correction of the refractive condition. The case reads better than many of such, inasmuch as it was approached from the other side from the usual. A woman of 47 asked the advice of Dr. Rohrer about her sight, and on correction of her astigmatism, which had never been done previously, she obtained very fair vision. After wearing these glasses constantly for a few weeks she told him that her nettlerash, from which she had suffered for thirty-five years, and which he had not even known to exist, had quite disappeared. It subsequently transpired that food had no effect on her eruption, that when it was about to appear she always felt miserably cold, that other means of treatment innumerable had failed to give her any but the most temporary relief. Now, when wearing the glasses she feels warm and comfortable, uses no medicinal or dietetic treatment, and yet is perfectly free of the old trouble. When an increase in the strength of the near-vision glasses came to be required, she began to suffer again, but the affection again went away when proper lenses were given. Drs. Oliver and Rohrer attempted to "cheat" the patient by giving lenses which they knew to be not quite correct, but the urticaria returned, passing away when correct glasses were again supplied. They were quite satisfied that the case was perfectly genuine.—*Philadelphia Medical Journal*, January, 1899.

THE BICYCLE AND EXOPHORIA.—A new argument in favour of bicycling is furnished by Pischel, of San Francisco, who relates the following as a case of exophoria cured by "wheeling." A merchant, aged 40, presented himself with alternating divergent strabismus and a considerable amount of astigmatism; tenotomy of the left external rectus was performed, but five months afterwards there was still some divergence, varying from *nil* to 30°. Pischel proposed a second operation, which was declined; the patient returned seven months later saying that his eyes were much better. Examination now showed orthophoria and binocular vision, of which singular change the only explanation to be obtained was that in the interval he had greatly taken to bicycle riding, and had daily ridden several miles, keeping all the way in the slot between the rails for a cable-car. During this agreeable form of orthoptic exercise one would of course require to keep the eyes carefully directed upon a small strip in front of the wheel, the effect of which persistent effort of co-ordination was as indicated.—*Archives of Ophthalmology*, March, 1899.

TOXIC AMBLYOPIA.—In Cuba, according to Santos Fernandez, toxic amblyopia is usually due to alcohol, tobacco taking quite a secondary place. He says that Havana tobacco does not by itself produce amblyopia, though some of those who work in the tobacco factories acquire slight general troubles, and external ocular alterations; and that the number of cases of alcoholic amblyopia increased during the two wars in Cuba, diminishing again very materially in time of peace.—*Revue Générale d'Ophtalmologie*, 2, 1899.

GLAZED PAPER.—The highly glazed paper used so much of late years for magazine and book printing is to be regarded as a cause of much of the asthenopia complained of by a number of persons. In former days the paper on which all such were printed was both thick and gray, and printing was done by a slow process and with heavy type, giving a thick black letter which contrasted readily with the surrounding surface, but now the rapid process, the "lightening" of the fine lines of the letters, and the high glazing of the paper used, combine to form a less satisfactory contrast, and a condition of affairs much more trying to the reader. A number of lights and shades are thus produced which are unpleasant to the eye, and often the paper has to be turned in two or three different directions before the print can be properly deciphered, which is somewhat analogous to the difficulty of reading in the dusk. The writer urges that school books in particular should be printed in a more "old-fashioned" style.—*New York Medical Record*, May 6, 1899.

COLLEGE OF PHYSICIANS OF PHILADELPHIA, SECTION ON OPHTHALMOLOGY.

Dr. George C. Harlan, Chairman.
Meeting, April 18, 1899.

A Note on Holocaine.—Dr. Wm. F. Norris said that it is well known that holocaine has found tolerably widespread acceptance as a local anæsthetic for the cornea and conjunctival sac, and that claims have been made for it as an antiseptic and germicide. He has used it in a considerable number of cases in both hospital and private practice, and has been specially gratified by its effects on corneal ulcers. In several such cases which for many weeks dragged along with slight progress and frequent relapses, great improvement has been manifested from the use of holocaine, as shown by rapid diminution of the infiltration area, and later by healing of the ulcer. The method of application has been by flushing the conjunctival sac with a 1 per cent. solution, and by touching of the floor of the ulcer with a little cotton swab saturated with it. It has been a question in his mind whether holocaine was really a germicide or whether it simply afforded a medium which was unfavourable to the growth of microbes. He therefore called in Dr. D. H. Bergey, of the Laboratory of Hygiene of the University of Pennsylvania, who found that a 1 per cent. solution of holocaine applied to staphylococcus colonies had no effect in half an hour, but killed all these microbes in two and a half hours. A 1 to 1000 solution of mercuric bi-chloride has a nearly similar effect: for two hours after the application the staphylococci were still alive.

Discussion.—Dr. Friebis has been favourably impressed by the use of holocaine as an anæsthetic in tenotomy, and considered its non-effect upon iris and ciliary muscle a decided point in its favour. In reply to a question of Dr. Oliver as to its action upon the corneal epithelium, Dr. Norris replied that the desquamation was inconsiderable. Dr. Hansell stated that he had used holocaine constantly for several weeks in a case of neuro-paralytic keratitis, with the gratifying results of relief to the severe pain, the reproduction of the corneal substance, and healing of the ulcer. Dr. de Schweinitz has used it in a case of hypopyon-keratitis with decided advantage. In reference to the strengths that can be used, Dr. Oliver referred to the recent researches of Scrini on the so-called oily collyria, in which it was determined that pure holocaine can be mixed with oil in the strength of 3 per cent. at a temperature of 80° C.; the author finding that the chief advantages of the plan were the increased power and the rapidity of action of the drug when placed in such a menstruum.

Dr. Wm. F. Norris exhibited *a Patient upon whom he had Operated for Symblepharon*, by transplanting a piece of skin from behind the ear into the raw surface of the eyeball. The transplant had healed without sloughing. The increase in rotation of the ball was marked.

Dr. Charles A. Oliver demonstrated a *New Method* (a modification of Frost's and Morton's plans) *for the Implantation of Glass Balls into the Orbital Cavity in Cases of Enucleation.*—After freeing the conjunctiva from the globe at the corneal limbus and dissecting it back so as to expose the tendons of the four recti muscles, each of the lateral muscle tendons is secured by a long, continuous catgut suture and freed from the eyeball. The vertical recti muscles are dealt with in the same way. Working in between the broad loops of catgut holding the ends of the muscles, the eyeball is enucleated without difficulty. The capsular cavity is thoroughly cleansed, and a glass ball which is water-tight and about three-fourths the size of the normal globe is placed in the situation previously occupied by the globe. The cut ends of the lateral recti are sutured together, followed by the vertical recti, thus enclosing the sphere within Tenon's capsule. The cut edges of the overlying conjunctiva are brought together by a series of silk threads, and the operative field is covered by a gauze protective bandage upon which iced compresses are placed. There is no reaction, and the socket is ready for the insertion of an artificial eye in a very brief time; in fact, earlier than after ordinary enucleation. The results are fully as good as those obtained by Mules' method. The operation is offered on trial for cases in which abscission, keratectomy, or evisceration with insertion of artificial vitreous is impracticable or impossible, thus affording opportunity to obtain well-fitting and freely mobile artificial eyes.

Discussion.—Dr. Harlan called attention to the fact that Mr. Carter was in the habit of closing the wound in abscission of the cornea by suturing the muscles over it after freeing them from the ball. He also stated that Dr. Risley had shown him a case in which a Mules ball inserted after enucleation had dropped out of the muscle-cone. He thought that the largest-sized Mules ball was too small for this purpose. Dr. de Schweinitz had employed Suker's method of preparing a stump for an artificial eye, *i.e.*, the suturing together of the recti muscles with catgut and the conjunctiva with silk after complete enucleation, and had produced an excellent cosmetic effect, which, however, he felt sure would be temporary owing to later shrinking of the tissues. Therefore, he thought Dr. Oliver's suggestion an admirable one.

Dr. P. N. K. Schwenk reported, by invitation, *Several Cases of Dislocation of the Eyeball.*—Traumatic dislocation may be *simple* or *compound.* In the former, the orbital tissues are stretched only, in the latter they are lacerated and the ball may have suffered injury, and in both the ball lies in front of the spasmodically closed lids. Case I. A child, blind from birth, while stooping ran a spear into the right orbit. Case II. A small terrier dog was run over by a heavy waggon, the wheel of which passed over his neck. The left eye was completely extruded. A canthotomy was done, when the ball jumped back into the orbit with a thud, and the lids closed in front of the cornea. The eye made a complete recovery. Case III. A man in falling struck his face (probably the external orbital angle) against a table. The eye and its adnexa were badly bruised and torn, demanding enucleation.

Dr. Wm. Campbell Posey reported *A Case of Complete Monocular Blindness from a Head Injury, followed by full Restoration of Vision.*—The case was that of a young man who had received a hard blow over his left eye by the occiput of his child's head while at play. The patient was quite stunned for fifteen minutes and suffered excruciating pain in his left eye and temple. The skin was not broken, and there was no hæmorrhage into the conjunctiva, or from the nose or mouth. Vision was unaffected until thirty-six hours after the accident, when a veil appeared to drop over the affected eye. Five days after the accident the eye was totally blind, the pupil was stationary to light stimulus, the head of the optic nerve was pale, and the venous pulse showed marked alterations in rhythm. The patient was placed in bed and leeched, his bowels opened by salines, and free diaphoresis obtained by jaborandi. This was followed by mercurial inunctions and later by potassium iodide. After three days of this treatment there was light perception in the upper nasal field, and in three weeks vision returned to normal. The fields of vision which were obtained as soon as sufficient sight was regained to make this possible were interesting, as they showed a small, absolute, central scotoma and a larger paracentral, relative scotoma. The author attributed the lesion to a fracture through the orbit, probably through the roof of the sphenoid, rejecting the explanation offered by Nettleship in three somewhat similar cases of a hæmorrhage into the sheath of the nerve.

Oculo-motor Paralysis from Typhoid Fever, with a Case.—Dr. de Schweinitz reported a case of complete right oculomotor paralysis without involvement of the ciliary muscle, occurring in a man aged 22, during the relapsing period of a severe case of typhoid fever. For months after the attack the ptosis had disappeared, but there was limitation of the upward, downward, and inward rotations, the inward movement being most limited. Dr. de Schweinitz briefly reviewed the literature of extra-ocular muscle palsies occurring as a complication of typhoid fever, and thought his case might be explained by a meningitis, or perhaps by an effect of the disease directly upon the oculo-motor nerve, producing a neuritis, precisely as it produces neuritis of other nerves in the body, notably those supplying the extremities.

Discussion.—Dr. C. A. Oliver asked if the case showed any albuminuria, as he was at present studying an excellent example of the nuclear type of relapsing oculomotor palsy following chronic nephritis from typhoid fever in a young woman, that served as an illustration of Knies' belief of association of the two causal conditions. Dr. de Schweinitz replied that albuminuria was not a factor in his case.

Is there a "Hypermetropia Acquisita"?—Dr. B. A. Randall challenged the common view that there is natural reduction in the refraction of the eye, and called for any competent evidence of it. That nearsight grows less annoying is generally ascribable to the narrow pupil of age; that farsight appears, which had been previously unnoted, is due to waning of the accommodation which had covered it. Flattening of the lens is as little proven as the popular idea that the cornea flattens; and the claim that the lens-layers become more homogeneous in refraction-index with age seems contrary to most of the known facts. The cases scientifically observed through the period from 55 to 80 must necessarily be few, and many will show increase of refraction from cataractous changes in the lens; unchanged refraction in a cited case in point might be plausibly but inconclusively ascribed to this, and in any showing decreased refraction proof that previous measurements were unimpeachable will be virtually impossible. Mydriatics are rarely used in presbyopic eyes, and can fail as signally to abolish spasm in them as in younger eyes; accommodation is present, although its range is shortened, and Donders even represents a dioptre as remaining at 80. The apparent confirmations of "H. acquisita" prove too much both in degree and rapidity of change, as in a case cited where H. = 1·50 at 54 became H. = 3 at 68, just as may happen in a few months with young eyes. Old eyes, like young eyes, are generally hypermetropic, often in notable degree; but the assumption that they are emmetropic in the middle period of life lacks scientific basis.

Dr. C. A. Veasey reported a case of *Double Choked-Discs in a Quiet Otitic Thrombosis of the Sigmoid Sinus, without Pyæmia.* — The patient, a boy, aged 12, had had an attack of diphtheria, mild in character, about four months before the appearance of the aural symptoms. At the time of the appearance of the latter there had been an unusually severe attack of earache with a mastoid abscess, from which he seemed to recover after evacuation by the attending physician. Two weeks later there was a facial paralysis of the same side, severe frontal headache, repeated vomiting, great emaciation, but no retraction of the head, no mastoid symptoms, and but slight elevation of temperature. The mastoid was opened by Dr. W. W. Keen and found filled with pus, and the wall of the lateral sinus gangrenous. The latter contained a half-decomposed clot extending nearly to the torcular Herophili. Recovery from the local condition was prompt. On the day of the operation, three days after the appearance of the cerebral symptoms, a very slight œdema of the discs was found, which, although the operation had been performed, continued to increase in intensity until typical choked-discs, with an enormous amount of exudate and hæmorrhages, were present. Later there appeared paralysis of the accommodation in each eye and paralysis of the right abducens. After several weeks these conditions subsided, and two years later there was a large, central, absolute scotoma in the left eye, with visual acuity of $\frac{6}{100}$, and a narrow, annular, relative scotoma in the right eye, with visual acuity of $\frac{6}{7\cdot5}$

Discussion.—Dr. Randall stated that such patients are in the earlier stages free from ophthalmic symptoms, and when they appear it is as frequently the side opposite to the lesion that is affected. Similar symptoms are found in pachy-meningitis and disturbances of the dura mater. Dr. Harlan was reminded of the first choked-disc he ever saw, which occurred in a case of old middle-ear disease in a delicate young girl. As there was no other symptom than violent headache, the ophthalmoscope was used as a means of diagnosis between intra-cranial disease and pronounced hysteria. After death a cerebral abscess was found separated from the carious tympanic roof by sound brain tissue.

Dr. G. C. Harlan reminded the Section that he had shown, about a year ago, a pair of bi-focals made by Borsch in which the reading part is formed of a circular lens 15 mm. in diameter, made of flint glass and sunk into the distant lens made of crown glass. The increased refraction of the small lens depends upon the higher index of flint glass, and its exposed surface is ground to the same curve as that of the larger lens. He has been in the habit of using these glasses in operating as well as in reading, and has found them entirely satisfactory. Recently Mr. Borsch has still further improved these lenses by burying the reading lens in the interior of the other so that it is practically invisible. The large glass is split into halves which are cemented together after the small one is inserted between them.

The glasses, which were exhibited, present no indication of their method of construction, which is a veritable puzzle to the uninitiated.

Discussion.—Dr. Thompson spoke in favour of the lenses, both from personal experience and that of his patients. He finds that the position and shape of the small lens allows one to walk, particularly up and down stairs, without difficulty.

Howard F. Hansell,
Clerk of Section.

THE PATHOLOGICAL SIGNIFICANCE OF SYMPATHETIC IRRITATION AND ITS CONNECTION, IF ANY, WITH SYMPATHETIC OPHTHALMITIS.[1]

By F. Richardson Cross, F.R.C.S.

Surgeon to the Bristol Eye Hospital; Ophthalmic Surgeon to the Bristol Royal Infirmary.

The consideration and discussion of the "Pathological Significance of Sympathetic Irritation," pure and simple, would prove, I think, a matter of considerable difficulty for any of us, but taken in connection with, or in contrast to, "Sympathetic Ophthalmitis," the subject is widened and simplified

I felt great hesitation in accepting the honour of opening this debate. I have but few facts to bring forward with regard to it, and must be content if I can suggest some lines of thought that may be elaborated by some of my distinguished auditors.

An eye that has been injured, either by an accident or through an operation, is frequently associated after a longer or shorter period of time with symptoms of discomfort, or of inflammation in its fellow, the affection in the sound eye depending upon the close functional and anatomical association of the organs of sight.

Nowhere else in the body are these conditions at all

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[1] Remarks in introducing a discussion on this subject in the Ophthalmological Section of the British Medical Association, Portsmouth, August 1899.

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analogous. The sense organs for taste and smell are practically central and single, and each ear appears to be entirely separated from its fellow, but the intercommunication of the two eyes is most complete whether we consider the psychical or physiological arrangement and control of the visual nerve tracts, the intercourse of the blood vessels and lymphatics, or the close binocular correlation which constitutes perfect sight, all of which must be, to some extent, interfered with by any imperfection of either eye.

The word "irritation" was formerly applied to all conditions of the sympathising eye. Next the term "sympathetic ophthalmia" was introduced, and of recent years a distinct separation has been made between cases of inflammation "ophthalmitis" and of irritation "neurosis."

The separation depends almost entirely upon the character of the symptoms which are present in the sympathising eye, and these can be classified under the two separate headings respectively, of *functional* and *inflammatory*.

The *functional subjective* disturbances, typical of *sympathetic irritation*, are weariness of the eye and disinclination for use, uneasiness, tenderness, or pain in the eye or orbital region ; blepharospasm, lacrymation, and hyperæmia of the conjunctiva, photophobia, muscæ, and photopsia ; dizziness or fogginess of sight ; obscurations of longer or shorter duration ; transient defects in the visual field, or even temporary blindness ; spasm or weakness of accommodation, or abnormal pupil action. A slight redness or haze of the optic papilla may be present, but careful examination of the eye fails to detect any signs of intra-ocular inflammation.

The symptoms of "ophthalmitis" are those of definite inflammation. They are peculiar and almost typical, and usually early implicate the uveal tissues.

Impaired function of the pupil is accompanied by iritis, keratitis punctata, and ciliary congestion. The iridocyclitis, usually of a mild serous type, and at first causing the patient but little discomfort, insidiously implicates the whole uvea, and gives rise to synechiæ of the pupil, and to vitreous opacities. Leber is of opinion that the optic nerve is the part first affected, but it is not easy to prove this by clinical observation. Papillitis seems to be absent in many early, well-marked cases of sympathetic uveitis, but, on the other hand, it is often present, sometimes as neuro-retinitis, or even with retinal hæmorrhages or œdema.

The purely "functional" symptoms of *irritation*, compared with the definite "organic" defects present in *sympathetic ophthalmitis*, render the diagnosis between them easy in typical cases; but clinically the two sometimes overlap one another. Cases occasionally present themselves in which doubtful signs of neuritis, or of iritis, suggest that an irritated eyeball is being threatened with the more serious inflammatory form of sympathetic mischief.

Again, cloudiness of vision affecting the sound eye after an injury to its fellow may be merely a symptom of irritation, but the optic disc should be carefully examined, for slight neuritis may be present without other organic symptoms, as the forerunner of a distinctive inflammatory attack.

As illustrative cases, I may mention the classical one of Donders, where a small fragment set up the most severe irritation in the good eye a few weeks after its fellow had been blinded by accident. The pain was intense, and the eye so irritable, that for two years the patient could make no use of it, and believed himself to be blind. But in two hours after removal of the exciter it could be fairly well used, and examined accurately as to sight and absence of organic mischief, and it completely recovered.

Lawson (*Royal London Ophthalmic Hospital Reports*, vol. x.) gives notes of sympathetic irritation coming on seven months after an injury. Injured eye removed. Complete recovery, and good sight for nearly nine years, then sympathetic inflammation and loss of sight.

I recently saw what seems a typical case of irritation possibly predisposed by some nervous affection,—Albert S., aged 44, who was formerly a porter in a warehouse, but for the past seven years has been unable to work owing to spinal disease. He said that for some time he had been in a nervous excited condition, often waking up at night, and unable to keep quiet in bed. The knee jerk was somewhat diminished. (The patient paid me one visit only, and the actual form of his nervous affection was not fully worked out.)

While the patient was cutting a stick at four years of age (forty years previously) the knife slipped and wounded his left eye. The wound healed well, and this eye, although blind and somewhat shrunken, has remainded quiet ever since.

His right eye was perfectly well until four years ago. Since then the patient has complained of photophobia, recurrent obscurations, lacrymation, and occasional slight conjunctival discharge. He says that the sight is at times quite clear, but at other times so cloudy that he cannot see anyone across the street. When this eye is well he can read continuously for about an hour, but when it is irritated he cannot do so for more than a few minutes at a time, owing chiefly to a mistiness which comes over the centre of the field, while the periphery remains comparatively clear. The right eye shows no signs of inflammation, no iritis, no impairment of accommodation, but there is doubtful haze over the optic nerve. The pupil reacts well to light and distance. Vision $=\frac{5}{6}$: J. 1 at 8—15 in. $-\cdot 50=\frac{5}{5}$.

The left eye is a shrunken stump probably containing ossifying choroid. Enucleation was advised, but has not yet been accepted.

We cannot with certainty foretell *what kind of damaged eye* may give rise to sympathetic mischief, or what one is perfectly free from risk of causing such complication. The exciting eye may be quiet, or may be irritable, or inflamed, when it gives rise to inflammation or merely to irritation in the sympathising one.

We know that where sympathising ophthalmitis proper has occurred some kind of perforating lesion of the exciting eye has been present in nearly every case on record, and that any report to the contrary should be received with caution. It is true that exceptions are found in cases that have been published of "sympathetic ophthalmia" occurring without any visible external wound in the injured eye. In some of these an inflammation of the uvea (iridochoroiditis or cyclitis) has attacked the second eye, at an interval after the first, by reason of a diathetic or other cause common to both, and without any sympathising connection between the two. In others the lesion has been a sub-conjunctival rupture of the sclera, caused by a blow. In the majority of cases in this group the sympathising eye has suffered merely from irritation, but in at least seven cases recorded by reliable observers, where no rupture through the conjunctiva could be found, definite ophthalmitis resulted. Even if we overlook the possibility of small conjunctival wounds escaping observation, are these cases exceptional? It seems to me doubtful how far a bruised conjunctiva is a reliable protection for the damaged contents of a ruptured eyeball against infection from without.

Again, it is possible for organisms to enter an uninjured eyeball from the blood stream, and to cause various well recognised forms of inflammation in connection with general diseases. Berlin and Hutchinson think that sympathetic eye diseases may be started by affected particles from the exciter circulating in the blood stream, and producing characteristic sympathetic symptoms as soon as they reach and develop in the congenial soil of the opposite uvea.

The original damage in some typical cases of sympathetic ophthalmitis may be very slight, as for instance a simple intra-ocular operation. Extraction of cataract or a needling after cataract extraction has caused it. In many of these cases iritis had complicated the operation, but in some the operated eyes seemed to be quite free of any inflammation throughout, and in a few the sight in them continued to be good, although the removal of the sympathiser was rendered necessary, on account of pain or degenerative changes.

Sympathetic irritation also follows punctured wounds; it may soon cease, or may recur from time to time for years without any further complication. It may be relieved by the removal of the exciting eye, or eventually be succeeded by an ophthalmitis. But more usually irritation is caused by old shrunken eyes, particularly if painful, or with ossifying choroid, &c. The irritation of glass eyes in the socket may bring it on, but it is important to recognise that all these conditions may also be productive of ophthalmitis.

Thus several cases are quoted in the reports of Nettleship and the Ophthalmological Society's Committee (*Trans.*, vol. vi.), where a glass eye has been the cause of sympathetic ophthalmitis, whether worn over a shrunken eyeball (No. 183, where neuroretinitis and later iridochoroiditis occurred in the sympathiser which was lost fourteen years after the destruction of its fellow by corneal ulceration,) or after enucleation of an eyeball (No. 199, where glass eyes had been worn in comfort for fifteen years, but a new one set up conjunctival trouble and then plastic iritis, which recovered after about three months).

A shrunken eyeball seems able to excite ophthalmitis when it is quite quiet and devoid of any microscopical evidence of inflammation (*Brailey, Trans. Oph. Soc.*, vol. iv.), or it may have previously become ulcerated or irritable.

Even the optic nerve stump left after enucleation of an eyeball may become involved in cicatricial bands or worried in some way so as to cause a sympathetic ophthalmitis in one case (No. 191), or a sympathetic neurosis in another case, both relieved by further operations on the faulty stumps.

Nor can we be certain as to the *length of interval* which will separate the injury to the exciting eye from sympathetic complication, whether this be functional or organic. A common period for the development of "sympathetic ophthalmitis" is two or three months, but many cases commence in two or three weeks, or even earlier. A man came under my notice with well marked sympathetic iridochoroiditis. Two years previously he had wounded his left eye with a nail. The right became at once very irritable; he says it was inflamed on the second day. On the seventh day after the accident the injured eye was removed by Mr. George Lawson (the right being then very bad and much inflamed), evidently without arresting the sympathetic disease.

On the other hand, out of the 211 cases of ophthalmitis published by the Ophthalmological Society's Committee (*Trans.*, vol. vi.), twelve eyes became inflamed as late as twenty years after the injury, the interval in three of the cases being no less than thirty-seven, thirty-eight, and thirty-nine years respectively.

In "sympathetic irritation" the period of interval varies just as much. It may be either short or very long, so that if we believe these cases in either class to be really sympathetic in their nature, and that they would not have occurred if the damaged eyeball had been earlier removed, we cannot feel absolutely safe at any period, nor can we say for certain what the character of the sympathetic mischief will be by reason of the interval which separates it from the original injury. A comparison, however, of the proportional number of cases occurring at different periods would seem to show that typical uncomplicated irritation is more likely than inflammation to occur after a prolonged interval. Thus, among the cases of which I have records, inflammation set in within the first year in sixteen out of twenty-three, while within the same period irritation had developed in only ten out of twenty-seven. In other words, within the first year inflammation was proportionally almost twice as frequent as irritation, Many slight cases of the latter, however, pass unnoticed, and others recur and extend into very lengthened periods after the original injury; while ophthalmitis has one definite commencement, and once established is continuous, and progressively destructive, so that deductions in this direction are not reliable.

The theories used to explain the occurrence either of sympathetic ophthalmitis or of irritation remain suggestive but unproven. To speak of one group as a reflex neurosis, and of another as a migrating ophthalmia or septic uveitis, has done good service as a working hypothesis, but we are still uncertain along what channels either the nerve currents or the infecting particles may pass, or what special kind of organisms may be concerned in the disorder.

Leber found hyperplasia of the optic nerve in nine cases of sympathetic ophthalmitis, and believed the disorder to be always due to optic inflammation, and that the first symptom in the sympathising eye was neuritis and not iritis. Snellen has also shown the presence of lymphoid cells around the optic nerve (*Trans. Internat. Med. Congress*, 1881). Brailey fully describes the microscopical appearances of the cellular infiltration in the affected uveæ of many sympathising eyeballs. He found a similar condition existing in the exciter, if removed while it was still inflamed, but he has seen many cases of undoubted sympathetic ophthalmitis, where the first eye, possibly a mere stump at the time of the outbreak, was neither tender nor painful, having long been quiet, and several eyes where such when examined microscopically presented, at the most, but very doubtful signs of present inflammation (*Trans. Oph. Soc.*, vol. iv.).

The various experiments by Deutschmann mark an epoch in the study of the disease. In his hands they have been almost conclusive, but they have not received satisfactory corroboration. Scarcely any other experimenter whether by injecting into the eye itself, or into the lymphatic channels associated with it, has succeeded in establishing any symmetrical inflammation of the eyes that resembled sympathetic ophthalmitis, and while the presence of cellular infiltration has been shown in the exciting, or in the sympathising eyeball, after its removal, many recent investigators deny that any micro-organisms can be found in the affected tissues, while others admit the presence of organisms but deny the possibility of experimentally producing sympathetic ophthalmia. If micro-organisms are the essential factor in the causation of this disease, it must, at any rate, be admitted that the specific organisms in question have not yet been demonstrated. Some say that sympathetic ophthalmitis never occurs in animals, and if this is so, we could scarcely expect to produce the disease by experiment, and many of the negative results may thus be explained.

Some of the latest observations are those of Angelucci (*Revue Général d'Ophtalmologie*, 1898), who gives results of experiments and bacteriological examinations from three cases of sympathetic ophthalmia. The removed exciting eyes contained micro-organisms, which in cultures showed pathogenic micrococci. A piece of iris was taken from each of the sympathising eyes, and showed micro-organisms, especially in the perivascular spaces. The cultures showed micrococci, which when injected into a rabbit's eye, caused iridocyclitis and infiltration along the optic nerve through the chiasma and down the sub-retinal space to the other nerve as far as the eyeball.

None of the animals showed sympathetic symptoms in the second eye; they died of general infection possibly before ophthalmia had time to declare itself. These and other experiments lead him to the opinion (1) that eyes suffering from sympathetic ophthalmitis always contain germs; (2) that these travel from the infected eye along the tissues of the optic nerve to the fellow eye; but (3) he does not believe that sympathetic ophthalmia can be artificially produced in animals, and considers the disease to be peculiar to man.

Bach (OPH. REV. vol. xv.) experimenting earlier on the same lines with cultures of various micro-organisms, had obtained absolutely negative results. But by means of chemical or mechanical irritants applied to the surface of one eye he produced at once in the fellow eye fibrinous exudations in the aqueous, vitreous, and sub-retinal space. These were demonstrated by immediate removal of the eye and subsequent examination under the microscope.

He concluded that prolonged irritation of an eye produces vascular dilatation and escape of the blood constituents, not only in it, but in the fellow eye also, and that sympathising ophthalmia is thus initiated by a neurotrophic action of the ciliary nerves, rather than by the direct agency of bacterial organisms; the intensity and duration of the irritation being of more importance in causation than the nature of the irritant.

In opposing Bach's views Angelucci brings forward arguments against the existence anywhere of special trophic nerve fibres, and considers that the results described are due entirely to vasomotor action, and resemble much more an ordinary hyperæmia than the conditions of definite inflammation that characterise sympathetic ophthalmitis.

Dr. Cecil Shaw (*British Medical Journal*, 1898, vol. i, page 1580) has made a series of experiments on rabbits' eyes to determine what changes, if any, follow prolonged irritation, external or internal. Wounds in the ciliary region were made while purulent conjunctivitis was set up by direct infection, and the conditions were in some cases maintained for several months; no iritis occurred in the wounded eye, nor were any abnormal symptoms produced in the fellow. Wounds with soiled instruments and the introduction of shot into the eye through the sclera, or into the ciliary region, seemed to produce scarcely any symptoms in the one eye or in the other. After death the eyes were removed and hardened, and the examinations under the microscope both for exudations and organic changes, and for the presence of micro-organisms, gave practically negative results.

Sympathetic ophthalmitis is usually caused by wounds or perforations of recent date, particularly in the ciliary region, or complicated with prolapse of the iris, conditions favourable for infection by organisms; but it is certainly rare after severe suppurative inflammation has taken place. Panophthalmitis of the exciter often causes irritation of its fellow, but seldom inflammation.

This fact has been used against the migratory theory, but it is not likely that the pus-producing cocci are those responsible for sympathetic neuritis or uveitis, and, indeed, the former organisms may be antagonistic to or destructive of the latter. The inflammatory exudation also may seal up the channels of communication in the eye, and prevent the transit of micro-organisms. In this connection I may remind you how many cases of fatal cerebral meningitis have occurred after excision of a suppurating eyeball; it would seem as though the operation opened up a passage for the pus organisms from the eye to the brain, possibly along the peri-vascular lymph spaces or those of the optic nerve, or by means of the cavernous sinus; and this hypothesis is rendered more probable by the fact that closure of the orbit by over bandaging seems to increase the risk of meningitis, while free washing and drainage diminish, if they do not entirely remove it. Here, as in the case of many of the injection experiments which have been made in order to cause sympathetic ophthalmitis, the organisms set up inflammation of the brain, while there is no evidence of the other eye becoming affected. The inflammation of a sympathising eye is never suppurative.

Cerebral meningitis very rarely results from an injury to the eyeball, or as a complication of sympathising ophthalmitis. Snellen (*Trans. Internat. Congress*, 1881), however, gives notes of an acute case of meningitis occurring simultaneously with sympathetic ophthalmitis. Microscopic examination of the exciting eye showed the uvea to be infiltrated with lymphoid cells, which were also abundant in the tissue surrounding the optic disc and in the subdural space of the optic nerve. A few other similar cases have been recorded.

Enucleation of wounded eyeballs, in which no inflammation has been present, or where inflammation has been very slight, has on several occasions been rapidly followed by fatal meningitis. Nettleship considers (*Trans. Oph. Soc.*, vol. vi.) that risk from this cause (excision of eyeballs) is not very materially increased by the presence of suppuration in the eye.

A very few cases have been published of fatal meningitis following intra-ocular operations: — (1) Seven days after a cataract extraction in a woman of 70 (Knapp); (2) Four days after needling opaque capsule in a child a year old (Warlomont); (3) Thirteen days after iridectomy for secondary glaucoma following cataract extraction in a woman of 68.

Very little opportunity is afforded for paying attention to the pathology of sympathetic irritation. The old theory of a "reflex neurosis," which has been deposed by that of "migratory ophthalmia," is now made use of to explain it. The symptoms in many cases are such as might be caused by an efferent irritation from the exciting eye carried along the ciliary branches to a nerve centre, whence the efferent impulses pass to the sympathising eye. These may cause defective or altered nutritive conditions in the tissues of the eyeball, or a diminished power of resistance to disease.

In other cases, however, the affection would appear to be due to the presence in the sympathising eye of organisms, capable for the time being of causing an irritation only, but liable at any time later to give rise to a definite inflammation.

It has been often observed that an operation on, or injury to, an eye that has been damaged or has undergone a former operation, is not devoid of risk; persistent inflammation of a low type not infrequently results; this may depend upon the materies morbi becoming active, which had been quiet, or possibly encapsuled, after the earlier wound.

Deutschmann (OPHTHALMIC REVIEW, ii., 23) in some of his earlier injection experiments, which were negative, considered that the spores did not excite the inflammatory process by germination, for they remained unaltered, and became enclosed in masses of pus corpuscles and young spindle cells. To this encapsulation by which the spores were rendered innocuous he attributed the fact that the sympathetic process may become retrograde.

It is sometimes risky to undertake an improving operation on an injured eyeball of some years' standing not only on account of the eye itself, but because it may set up serious irritation or even sympathetic ophthalmitis in its fellow. The simple needling of an opaque capsule after cataract extraction has caused such a result.

A permanent damage to the eye seems to be sometimes inflicted in the course of a sympathetic irritation. Thus, Brailey (*Trans. Oph. Soc.*, vol. iv.) quotes 29 cases where enucleation of the exciter was performed to relieve irritation. Sixteen were cured while 13 were uninfluenced or rendered worse. If the irritation in these cases was a pure neurosis set up by the injured eye, why were they not all cured by the removal of the cause ?

Irritation often continues for years without any inflammation occurring, or it may last only a few days before inflammation follows it. The temporary irritation which seems to culminate in inflammation would appear to be different in its causation, from that which occurs independently.

I regret that neither my own personal experience nor what I have been able to gather from the writings of others, has enabled me to deal in a more capable manner with the "Pathological Significance of Sympathetic Irritation."

I have no doubt that a seriously damaged eyeball is prejudicial, more or less, to its fellow, and may predispose it to various kinds of discomforts, if not diseases, and that one which possesses no useful sight should be removed or eviscerated, while a shrunken globe interferes with the safe wearing of a glass eye, and may at any time become a source of danger. A degenerated inflamed eyeball seems likely to make an excellent incubator for micro-organisms, and it is certainly damaging to the general health, which I have often seen materially benefited by its removal. Synechiæ and cicatricial pressure or traction should be, if practicable, relieved, but the rules of conservatism in surgery should not be overstated in order to retain blind and often dangerous eyes. The good practice initiated by Augustin Prichard for the removal of eyeballs in association with sympathetic troubles should be still further extended, and an eye that is neither comely nor useful, and which is in any degree a possible source of mischief to its fellow, should be enucleated.

JAMES THORINGTON, M.D. Retinoscopy. *London: H. Kimpton. Third Edition.* 1899.

Amid the multiplicity of pamphlets, *brochures*, and chapters of larger works which are devoted to the subject of retinoscopy, it is not easy for a new treatise, however serviceable, to find a place. Dr. Thorington's little book on this subject is, however, so modest and withal so thoroughly practical, that its perusal will ensure for it a warm reception among the disciples of retinoscopy. There is no attempt made to enter deeply into thorny mathematical jungles, the aim of the writer is to present a plain straightforward account of his favourite method of ascertaining the refraction, and this he does not fail to do; while if to our mind he is a little over-enthusiastic about the possibilities of a method which is, no doubt, of immense value, but which to our view has certain limitations, we must not quarrel with him on that account. The advice given in regard to the whole procedure seems to us thoroughly sound except in one particular, and well worthy of careful attention and study; the point on which principally we fail to agree with him is the question of the position of the source of illumination. The author prefers to have this quite near to his mirror and well in front of his patient, an arrangement similar to that recommended by Jackson, but one the advantages of which we must confess ourselves to be unable to appreciate. The revisal of this edition might well have been a little more careful, for there are several examples of grammatical errors which ought not to have escaped notice and correction. The illustrations are simple and to the point, and the volume is completed by an index more remarkable for copiousness than for value. The fact that the present is the third edition of a book which was born in March 1897, speaks volumes for its worth to the classes to whom it is addressed, namely, students and post-graduates.

TRANSACTIONS OF THE HEIDELBERG OPHTHALMOLOGICAL SOCIETY, 1898.

First Notice.

C. Norman-Hansen (Copenhagen). *The Conjunctival Suture in Severe Wounds of the Globe.*—The two chief indications in perforating wounds of the globe, viz. (1) protection against infection; and (2) even pressure to keep the scleral and choroidal wound edges in contact, are both, in the author's opinion, fully satisfied by the application of a simple conjunctival suture without any scleral suture. He finds it quite sufficient to prevent prolapse of choroidea and vitreous, as well as a protection against fresh wound infection; and the sutures remain in long enough to permit the scleral wound to close, viz., six days. The simple conjunctival suture has the advantage that it can be applied after the most extensive scleral wounds without loss of vitreous, and may be employed also when the lens is extruded under the conjunctiva.

In the discussion attention was directed by some of the speakers to the fact that the treatment is by no means new, having been in use for more than twenty years, and others advocated scleral sutures as a necessity in many cases, combined with superficial conjunctival sutures.

A. Siegrist (Basel). *The Danger of Blindness in Ligature of the Common Carotid.*--The following ocular lesions have been observed after ligature of the carotid. (1) Long continued or permanent defect of sight, sometimes amounting to complete blindness; (2) Ulceration of the cornea; (3) Cataract; (4) Strabismus, and (5) Panophthalmitis.

As regards the first, little is known about its pathology; but the ulceration of the cornea probably depends upon defective nutrition. Cataract is a rare occurrence; strabismus is probably due to a central lesion, and of course panophthalmitis is a septic infection.

Siegrist records two interesting cases. The first was one of lingual cancer. The external carotid was ligatured at the operation, and eight days later the internal and the common were ligatured for secondary hæmorrhage. That very day the patient observed the loss of sight; and when examined next day the eye presented the typical picture of embolism of the central artery, with interrupted blood columns and irregular movements of the blood. On the fifth day the retinal circulation was completely abolished, and the man died on the sixth day.

At the autopsy a thrombus was found in the internal carotid, which extended 6 mm. into the ophthalmic artery. This showed signs of commencing organisation. The walls of the ophthalmic and of the central artery were intact. In the retina the pathological changes were for the most part restricted to the inner layers. In the cornea changes were present resembling the parenchymatous keratitis produced by Wagenmann by division of the long ciliary arteries.

The second case was one of pulsating (traumatic) exophthalmos.

The external and internal carotids were ligatured, and the next day the patient complained of loss of sight. On the seventh day there was only projection in the temporal quadrant of the field, and the ophthalmoscope disclosed the picture of embolism of the central artery.

Five months later Siegrist examined the case. The papilla exhibited the appearance of simple atrophy with thread-like vessels not visible beyond the edge of the disc. Many choroidal vessels showed signs of commencing sclerosis, and the fundus was full of minute pigment granules, which lay in front of the choroidal vessels. Some eighteen months later, three-fourths of the choroidal vessels were sclerosed, and the pigment had collected itself in lumps at the borders of the sclerosed district. Siegrist attributes these changes to a thrombus in the ophthalmic or central artery produced by the operation, followed by thrombosis of most of the choroidal ciliary vessels.

In the discussion Uhthoff mentioned two cases anatomically examined after ligature of the carotid. In one there was amaurosis, and the signs of embolus of the central artery, but no thrombus in either the retinal or the ophthalmic artery, and in the other there was neither blindness nor thrombus. The latter he considers as the usual condition, as the anastomoses between the ophthalmic and the internal and external maxillary are commonly sufficient to maintain the retinal function on these cases. He also stated that he had observed the immediate effects of ligature of the carotid in another case ophthalmoscopically. Retinal anæmia was well marked, but passed away after a short interval.

Pflueger advocated digital compression in these cases, but stated that he had never seen any ill result from ligature of the carotid in young persons. Zimmermann supported this view, and advised digital compression as a preparation for ligature in order to develop collateral circulation.

TH. AXENFELD (Rostock). *Lacrymal Gland, Physiology and Histology.*—The well known observation that new-born infants do not weep has been ascribed by Kirchstein to their possessing a gland which is incapable of secreting, but Axenfeld finds the gland histologically quite capable of secreting. All that can be said is that it is not actually secreting. Formerly, Axenfeld thought the absence of an adenoid interstitial tissue might account for the absence of secretion, but this cannot be the case, for this adenoid tissue steadily increases in old age, while the gland itself slowly atrophies. Besides, many glands have none of this interstitial lymphatic tissue, *e.g.*, the liver. For secretion blood vessels are necessary, and also nerves. The infantile gland has the former, and also the latter, as the nerve is well formed at this period. Axenfeld is therefore inclined to attribute the absence of secretion to a central defect, which affects both the psychical and reflex secretion.

L. HEINE (Marburg). *Change in Shape and Refraction of the Lens after Division of the Zonula.*—Heine examined the lenses of young persons whose refraction he had estimated shortly before death by retinoscopy, and also by the same method *post mortem.* (He found that the refraction was not appreciably altered by death.) After removal of cornea and iris the radius of the anterior curve was measured by Helmholtz's ophthalmometer. It amounted to 13 or 14 mm. Then the zonula was divided and Heine found the radius always reduced to 8 to 10 mm.

The co-efficient of refraction at the anterior pole of the lens was measured by Abbé's refractometer. In one eye it was 1·390. In the fellow eye after division of the zonula it was 1·380. The index of the nucleus remained constant at 1·410, so that by Matthiessen's calculation the total index for the resting lens is 1·430, and for the lens after division of the zonula 1·440.

W. UHTHOFF (Breslau). *Visual Hallucinations in Diseases of the Eye.*—After pointing out the difference between hallucinations and illusions, Uhthoff records the following cases:—

(1) An old myopic woman with double central choroidal

atrophy and positive central scotoma. No change for years till one day she suddenly observed objects like grape leaves in the region of the scotomata. The hallucinations were not constant, and were not affected by her will in any wise.

(2) A woman of 40, with sympathetic ophthalmitis. She observed birds, angels, human heads, and colours. Shutting the eyes did not remove the hallucinations.

(3) A lunatic of 40, with central choroidal atrophy and positive scotoma, saw a figure before the affected eye, not before the other which was sound.

In the first two peripheral lesions seem to have caused certain distinct central changes, for Uhthoff regards them as instances of hallucination. The third case is one of illusion.

In Case 1 the hallucinations appeared larger when the patient fixed a more distant object.

Other cases are then given, some with hemianopic hallucinations, and references are made to much of the literature of the subject.

E. v. Hippel (Heidelberg). *Diagnosis of Lesions of the Corneal Endothelium.* — It has been held by some that parenchymatous keratitis is due to defect of the corneal endothelium. V. Hippel suggests a simple method of diagnosing such endothelial defect by instilling fluorescine into the conjunctival sac. If experimentally a small abrasion is made on the posterior surface of the cornea, and fluorescine is dropped into the conjunctival sac the endothelial defect and a portion of the cornea as well is coloured by the reagent. In fact, colouration ensues even after regeneration of the endothelium if the physiological function of the cells has not been restored. In practice the pupil must be dilated, as the green colour is only seen against a dark background. A drop of fluorescine is put into the conjunctival sac and, after a couple of minutes, washed off with biborate of soda. V. Hippel has found a staining of the deeper corneal layers in some twenty cases. Thirteen of these were of the type of the keratitis profunda of Fuchs's text-book, and in only one of them was there evidence of hereditary syphilis.

V. Hippel suggests that by means of this reagent we may be able to make a better classification of the various forms of keratitis. It is pretty generally admitted that inflammations clinically alike may depend upon very different causes. In the keratitis of hereditary syphilis, V. Hippel obtained the reaction in two cases, but the cases were of long standing, and he is inclined to regard the defect of the endothelium as a secondary phenomenon, as in three other fresh cases no reaction was got, as also in all the other cases tested. The keratitis of hereditary syphilis, therefore, does not begin by any defect in the endothelium. The reaction was obtained, too, in a case of congenital buphthalmos; and also in a case of keratoconus with infiltration in a child of three days old. V. Hippel believes this gives support to the theory of Elschnig and Panas that typical keratoconus is due to disease of the endothelium. In another child born with exophthalmos, corneal opacity, and blood on the iris, the reaction was found, but *post-mortem* examination showed no defect in the endothelium. This may be accounted for by microscopic rents in Descemet's membrane, as seen by v. Hippel in another new-born infant. Or the endothelium may have been injured by the contact with blood. Or the high intra-ocular pressure may have been the cause.

That the aqueous humour can enter the cornea in acute glaucoma, v. Hippel has seen in two cases by means of this fluorescine staining.

In another case of iritis with hypopyon a green stain was also obtained in the deeper layers of the cornea.

P. SILEX (Berlin). *The Central Innervation of the Eye-muscles.*—The text of this communication is furnished by a case of unilateral nystagmus caused by a blow on the head, which remained strictly unilateral during a period of two years. As central innervation lesions after a certain time always spread to the two eyes, this case may be regarded as a puzzle to physiologists. However Fritsch and Hitzig have found a region of the brain which coincides with a portion of the facialis centre, whose stimulation produces movements of the eye of the opposite side only.

This observation has been corroborated by Luciani and Tamburi, but controverted by Knoll. At present it seems to be allowed that there are three places in the cerebral cortex which may be regarded as centres for eye movements. One is in the optic region (Sehsphaere), one in the neck region, and the third is Hitzig's centre.

As the result of numerous experiments Silex comes to the conclusion that Hitzig's centre is certainly a centre for eye movements, and a centre for voluntary movements. Whether it is a centre for all ocular muscles is not decided; the experiments show that its principal function is to excite the abducens and superior oblique of the opposite side.

A lesion of this centre explains the case of unilateral nystagmus reported. The other two centres admitted are to be regarded as Association-centres: that in the optic region brought into action by visual impression, and that in the neck region associated with movements of the head as a whole.

St. Bernheimer (Vienna). *The Reflex path of the Pupil Reaction.*—Experiments on monkeys permit us to draw the following conclusions, which hold good for man as well as monkey.

Both visual fibres and pupillary fibres suffer a partial decussation in the chiasma.

Each eye is connected with the sphincter nucleus of both sides by means of pupillary fibres.

The partially crossed pupillary fibres run along with the partially crossed visual fibres in the optic tract, and bend towards the middle line near the corpora geniculata to reach the sphincter nucleus.

Besides this union of each eye with both sphincter nuclei by means of the partially crossed fibres, there is also a central connection between the two nuclei. In addition to experiments which consisted in following up degenerated fibres microscopically, Bernheimer bases his conclusions on the observation of the persistence of both direct and consensual pupillary reaction after complete section of the chiasma in one series of cases, and also persistence of both after section of one optic tract in another series.

LUDWIG BACH (Wuerzburg). *Experiments relating to the Pupillary Fibres and the Pupillary Reflex Centre.*—After enucleation or exenteration in rabbits and cats Bach has found a well defined connection between the optic tract and the anterior part of the corpora quadrigemina, but never any direct connection of the tract with the oculomotorius nucleus.

Division of the optic nerve produced changes in the ganglionic layer of the retina, but no effect upon the parareticular cells, which Schirmer believes to be the end organs of the pupillary fibres.

Decapitation experiments show that the pupillary centre lies just below the medulla oblongata, as if so little as 2 cm. of the spinal marrow was left intact the reaction remained normal, while if this small piece was cut through the reaction ceased.

E. HERTEL (Jena). *Results of Division of the Optic Nerve in Young Animals.*—After division of the optic nerve behind the point of entrance of the central vessels in rabbits of about three weeks old the ophthalmoscopic appearances are quite normal except for occasionally a transient hyperæmia of the papilla. In 7 cases where the smaller ciliary vessels happened to be injured, a localised haze of the retina was seen, which was followed by the pigmentary degeneration described by Wagenmann as resulting from occlusion of the ciliary vessels. In the remaining 23 cases no such result followed. In all the cases atrophy of the papilla and medullary fibres began to show itself in about three weeks, and complete atrophy developed in about six months, the retinal vessels remaining normal. Anatomically the papilla, medullary fibres and the whole nerve fibre layer of the retina were atrophic by the end of six months, while the ganglion cells only began to become atrophic about the fifth month, and were not entirely atrophied at the end of one year. Hand in hand with this atrophy of the nervous elements there occurred hyperplasia of the connective tissue elements, and finally changes in the bacillary layer, mostly of proliferating type.

Phthisis bulbi did not result, but a well marked decrease in the growth of the eye occurred, probably owing to defective development from loss of function.

H. Schmidt-Rimpler (Goettingen). *Ulcus Rodens Corneæ.*—This form of ulcer is not to be confounded, as has been done by many ophthalmologists, with ulcus serpens. It was described by Mooren in 1867, and has been recorded since by several observers, but the present case is the first in which an anatomical examination has been made.

The ulcer occurred in the person of a man, aged 31, in April, 1897. It was situated at the edge of the cornea, and resisted treatment elsewhere, till in August the patient came to Schmidt-Rimpler. The ulcer then occupied all but the lower third of the corneal periphery. At some places on the border a grey vascular cicatrix had formed, and the floor of the ulcer was translucent and grey with vessels running into it from the periphery. The central edge of the ulcer was grey and undermined. There was a small hypopyon. The ulceration extended in spite of repeated paracenteses, peridectomy, iodoform, nosophen, scraping, until only a small peripheral piece of the cornea remained sound, the pupil became obscured, and vision reduced to light perception.

The eye was enucleated in November. Microscopically and bacteriologically there was nothing pathognomic.

This form of ulcer is distinct from ulcus serpens. It begins at the periphery, has no great tendency to hypopyon or to cause perforation, and usually heals at the edge with formation of new vessels, while it advances towards the centre. It is frequently bilateral. Etiology is uncertain, and therapeutics unsatisfactory. Galvano-cautery, peridectomy and repeated paracenteses are the means most useful, but they often fail to effect a cure.

In the discussion Pflueger remarked that the differential diagnosis should be simple, in consequence of the peculiar smooth aspect of the floor of the ulcer and the way it lay parallel to the surface of the cornea ; besides the uplifting of the epithelium at the advancing edge of the ulcer. He believed the failures to arrest by cauterisation were mostly due to not cauterising the apparently normal tissue of the cornea at the edge of the ulcer.

Goldzieher related a case where the ulcer healed with a pterygium-like membrane covering the surface. After removal of this pseudo-pterygium, vision was greatly improved, and he advises the treatment of these ulcers by conjunctival plastic operation.

Nieden stated that fluorescine shows distinct infiltration in the apparently normal cornea close to the edge of the ulcer, and that cauterisation of this infiltrated tissue gives the best hope of arresting the ulceration.

(*To be continued.*)

FRENCH SOCIETY OF OPHTHALMOLOGY. CONGRESS, 1899.

Recueil d'Ophtalmologie, May and June, 1899.

First Notice.

Report on the Removal of the Transparent Lens. M. Pflüger (Berne).—It is in the cure of high myopia that removal of the transparent lens presents the greatest theoretical and practical interest. As regards the two serious objections to the operation, loss of accommodation and detachment of retina, the pernicious consequences of accommodation on the nutrition of the myopic eye are removed, whilst nothing justifies the fear of a predisposition to retinal detachment caused by the aphakia, the results pointing rather to a prophylactic influence. The operation should not be blamed for causing a detachment, unless it has been accompanied by complications. From the end of 1891 to the end of 1896 Pflüger operated on 103 cases (108 eyes), and has been able to follow up 95. He points out that it is necessary to be exact in the estimation of the ametropia; the astigmatism and the radius of curvature of the cornea being determined by Javal's ophthalmometer, the state of the refraction might be directly expressed by the neutralising lens placed at the anterior focus of the eye, according to the ophthalmometric method of Giraud-Teulon. Observations show that removal of the lens is not always followed by the same diminution of refraction in eyes which had the same degree of myopia. This is due to errors in the determination of the ametropia. Those errors due to spasm of accommodation can be avoided by the use of atropine, and those due to insufficient correction of astigmatism by the employment of the ophthalmometer. Errors, more or less inevitable, result from the difficulty of placing the correcting glass at the anterior focus of the eye, which varies according to the radius of curvature of the cornea. The errors resulting from position, degree of curvature, and index of refraction of lens or aqueous are negligible. According to a formula established by Pflüger for the approximate prognostication of the refraction after aphakia in different degrees of myopia, a myopia of 16 D. with a corneal refraction of 50 D. will become emmetropia, as also a myopia of 18 D. with a corneal refraction of 45 D., and a myopia of 20 D. with a corneal refraction of 41 D. or 42 D.

Of the ninety-five cases which Pflüger analysed, eighty-nine had one eye operated on, and six had both done. Hereditary influence was noted in 52 per cent. of cases; and in 91 per cent. the myopia was congenital. The operation was done in eighty-three cases between the ages of 7 and 30; in twelve cases between 30 and 40; in five between 40 and 50; and once at 51. Patients from 7 to 10 years with high myopia ought certainly to be operated on, and even if the myopia is below 12 D. and there is a fair corneal curvature, we should not wait for irreparable changes in the fundus or vitreous before interfering; for a myopia of this degree is to be looked upon with suspicion, and operation gives a better guarantee for the maintenance of the *status quo* than wearing glasses.

For determining in what cases it is justifiable to interfere, it is necessary to consider not only the degree of myopia, but also the age of the patient, the mean corneal refraction, the visual acuity, the general condition of the patient, his social position, and the progress of the myopia in himself and his family. If reduction in visual acuity compels the patient to change his profession, operation would be indicated for a myopia distinctly below 16 D. Rapid increase in the myopia before 20, and particularly after that age, would be an indication for operating in even moderate degrees of myopia.

Pflüger's cases have been followed up for a period of from two to seven years and allow of interesting deductions.

The cases are divided into three clases, according to the degree of myopia at the time of interference.

The first class comprises myopes of 10 D. to 13 D. Three cases, from nine to eleven years, were operated on for a myopia of 10 D., with a resulting hypermetropia of from 3·75 D. to 5·75 D., and a marked increase in visual acuity. One case was attacked with choroiditis two years after operation, which seriously affected the vision. In 5 cases of myopia of 11 D., 3 were aged from 8 to 12 years, 1 was aged 15, and 1 aged 20; the resulting hypermetropia was 2·5 D. to 5 D., and the visual acuity in all cases was improved.

Of 20 cases of 12 to 13 D., 14 were below 20 years, and 6 between 20 and 28 years. The resulting hypermetropia varied from 2 D. to 5 D., and the vision was improved in all the patients but one, whose sight was lost from detachment of the retina ensuing some years after the operation.

The second class comprises myopes of 14 D. to 15 D. In 12 cases the myopia was 14 D., and in 4 it was 15 D., the age varying from 9 to 23 years in 14 patients, one patient being 30, and another 40.

Four times there resulted emmetropia in one meridian, the other being corrected by concave cylinders of from 1 D. to 2 D. In the other cases the correcting spherical lenses varied between 1 D. and 4 D.

The third class includes 53 cases of myopia of 16 D. to 29 D. The age of the patients varied between 7 and

51 years. In 1 case of 16 D., 3 cases of 20 D., and 1 case of 21 D., the refraction became emmetropic after operation. In 19 cases the refraction was still myopic, 1 case having an initial myopia of 17 D., 3 cases of 18 D., and the others of 19 to 29 D. The myopia or hypermetropia resulting in all cases never exceeded 4 D.

Visual acuity was improved in all cases but 2, in 1 case there was a secondary infection following the discission, and in the other a central retinal hæmorrhage in the course of an attack of *delirium tremens*. In addition two eyes have lost their vision after some years, one from retinal detachment and the other from severe choroiditis.

Pflüger thinks that the improved visual acuity depends on a better nutrition of the organ leading to an improvement in the function of the retina, as well as on the development of the function of the occipital lobe by distant vision. He has in most cases found an improvement in visual field and colour sense. In his own cases he has not found one in which the myopia made any disquieting progress during the period of from two to six years after operation.

In the most unfavourable cases the elongation of the antero-posterior axis was less in the eye operated on than in its fellow.

The comparison of the two eyes leaves no doubt of the prophylactic action of the operation. Pflüger considers extensive corneal opacity as about the only real contra-indication. Neither myopic choroiditis nor old central choroiditis, with definite loss of central vision, contra-indicate. Severe acute central choroiditis is, moreover, an urgent indication for operation. Discission not extending to the posterior capsule and followed by simple extraction aided by the curette is recommended in all cases.

Increase of tension, even if painless, should call for linear extraction. The lance should be inserted in the limbus and the curette be used only to evacuate loose masses of lens substance, the operation being reduced in a manner to simple paracentesis, which can be repeated several times without danger. With regard to flap extraction, it should be reserved for those ages when a hard nucleus is expected, or in cases where a first discission has proved the existence of such a nucleus. In the discission of secondary cataract Pflüger lays stress upon the danger of interference with the vitreous, and prefers using the "pince-ciseaux" of De Wecker or the harpoons of Stelling. With regard to post-operative complications, infection of the wound is possible in spite of all precautions, and detachment of retina, Pflüger holds, is merely a question of chance; for, although loss of vitreous should be avoided, it is not the only factor in producing detachment, since in the one case in which it ensued there had been no loss of vitreous, and 9 cases in which vitreous had been lost did not become affected with detachment.

Glaucoma has not resulted, but it could be met by iridectomy. It is difficult to say whether vitreous opacities may be the consequence of intervention.

M. Vacher said that he had experienced no failure amongst 61 cases, operated on during a period of ten years, and examined from year to year. He gave the following *résumé* of his observations. (1) Operation should not be undertaken too early. The formula he had given for operating above the age of 12 years, when the myopia in dioptres was greater than the age in years still held good. (2) The operation had an undoubted influence upon the choroidal lesions—unless very extensive—which even improved, accompanied by progressive increase in visual acuity. (3) The removal of the lens is an undoubted prophylactic against detachment of the retina. Many eyes, however, should not be operated on, because they are not in a condition to withstand the disturbance of equilibrium. Loss of vitreous and repeated discissions must be avoided. (4) Operation should not be advised unless really needed, and presenting every chance of success.

M. Trousseau performs free discission followed by evacuation of the opaque lens masses. He attaches great importance to the general condition of the patient. He always fears the operation for secondary cataract, and prefers to use the "pince-ciseaux" of de Wecker. Seeing that the operation is new, and that we are not yet absolutely certain of its possible results, he holds that we should practise it guardedly, lest we bring it into discredit.

M. Rohmer extracts as much of the lens as possible at a first sitting, and later uses suction and forceps to remove the remaining masses.

M. Vignes does a flap extraction, and removes any opaque masses from three to six days later, freeing the pupil from capsular *débris* by means of forceps.

M. de Wecker makes a large crucial incision in the capsule, and later performs simple extraction, taking every care to avoid injuring the vitreous.

M. Salzer spoke of the determination of the true as opposed to the apparent visual acuity of the myopic eye.

M. Lagrange would not extend the operation to myopes of 10 D.

Experiments upon Tuberculosis of the Lacrymal Sac. M. Gourfein (Geneva).—In one series of experiments a solid tubercular culture was introduced into the lacrymal sac of rabbits; in a second the lacrymal gland was removed two or three weeks previous to inoculation. In all cases infection was effected, proving that the lacrymal sac can be inoculated and that the lacrymal fluid does not diminish the virulence of the tubercle bacillus.

The author has observed three forms of tuberculosis of the lacrymal sac:—(1) Chronic abscess in the anterior wall, leading to a fistula, the pus escaping into the nasal duct; (2) Formation of fungosities with escape from the puncta of thin yellowish pus, containing bacilli; (3) Granulations of the sac, to which attention is called by epiphora, the liquid not ordinarily containing bacilli but being very irritating to the palpebral and bulbar conjunctiva, and producing smart conjunctivitis.

(*To be continued.*)

THE USE OF EUPHTHALMIN: A NEW MYDRIATIC.[1]

By James Hinshelwood, M.A., M.D., F.F.P.S.G.

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Although for most ophthalmoscopic examinations dilatation of the pupil is not required, still there are many cases where the use of a mydriatic is absolutely necessary in order to make a thorough examination. The mydriatics in use at present have certain very decided disadvantages. Homatropine, though dilating the pupil rapidly and effectively, has the very great disadvantage of producing a paralysis of accommodation lasting from twelve to twenty-four hours. Cocaine, very uncertain in its action as a mydriatic, cannot be relied upon to produce a maximum dilatation of the pupil, and besides it often causes a desiccation of the corneal epithelium. Duboisine and scopolamine are very toxic agents, and ephedrine produces a painful conjunctival irritation.

Euphthalmin, while producing a prompt and efficient dilatation of the pupil, is comparatively free from the disadvantages associated with all the mydriatics hitherto employed in ophthalmic practice, and hence merits the attention of ophthalmologists. Having made a careful and extensive trial of this new mydriatic, I thought it might be interesting to others to hear the results of my experience.

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[1] Read in the Ophthalmological Section of the British Medical Association, Portsmouth, August, 1899.

Ophth. Review. Vol. XVIII., No. 217, November, 1899.

Euphthalmin is a synthetic preparation. It is a white crystalline powder, very soluble in water, and is the hydrochloric acid salt of n-methyl-vinyldiacetonalkamine. It is closely related to the new anæsthetic Beta-eucaine, having the same relation to it chemically as homatropine has to tropa-cocaine. The action of this new preparation upon the eye was first investigated by Dr. B. Treutler,[1] assistant in the Marburg University Eye Clinic, and was recorded by him in the *Klinische Monatsblätter für Augenheilkunde*, September, 1897.

Vossius,[2] Schneider,[3] Winselmann[4] and Darier,[5] have also recorded their experiences with this new mydriatic. All these observers, while differing in matters of detail as regards its action, are agreed as to its great value as a mydriatic and its utility in ophthalmic practice.

In the following observations, the strength of the solutions employed was 5%, which was found to be the strength best adapted to produce dilatation of the pupil rapidly and with a minimum of discomfort to the patient. The 2% solution is too weak, producing dilatation only very slowly, and the 10% solution, whilst only increasing very slightly the rapidity of dilatation of the pupil, increases very decidedly the disadvantages associated with the use of the drug, the paresis of accommodation being greater and more prolonged, and the dilated pupil taking a much longer time to return to its normal size.

The 5% solution of euphthalmin does not act quite so rapidly as the 1% solution of homatropine, but it produces quite as great dilatation of the pupil.

A large number of comparative experiments were tried by instilling a 5% solution of euphthalmin into one eye and a 1% solution of homatropine into the other eye of the same patient. The maximum effect of the euphthalmin was produced most rapidly by instilling three separate drops with an interval of two minutes between the drops. It was found that the pupil of the eye treated with the homatropine began to dilate first, and that the dilatation progressed in advance of the other until the maximum dilatation was obtained. The homatropine took about fifteen to twenty minutes to produce maximum dilatation of the pupil, and the euphthalmin used in the manner indicated above took from twenty to thirty minutes to produce the same effect. It was found that the age of the patient has a direct bearing on the rapidity of dilatation of the pupil, the drug acting more rapidly on the young than on the old.

Snéguiroff of Moscow has pointed out that the previous instillation of holocaine into the eye favours and quickens the diffusion of fluids from the conjunctival sac into the anterior chamber of the eye. I pointed out in a paper read at the last meeting of the British Medical Association that holocaine anæsthesia is produced much more rapidly than that of cocaine. Acting on this hint I made a number of comparative observations, instilling a drop of 1% solution of holocaine into one eye, and subsequently the euphthalmin, then into the other eye the euphthalmin alone without any preliminary instillation of holocaine. It was always found that the pupil of the eye into which the holocaine had been instilled began to dilate first, continued in advance, and reached its maximum dilatation about seven or eight minutes sooner than the other. The preliminary instillation of a drop of 1% holocaine solution increases the rapidity of the mydriatic action of the euphthalmin, and puts it quite on a par with homatropine as regards rapidity of action, producing a maximum dilatation of the pupil in about twenty minutes.

The dilatation of the pupil produced by euphthalmin passes off more rapidly than that produced by homatropine. For a short period after the pupil has attained its maximum dilatation it will be found to be insensitive to light and not to contract on accommodation. This immobility of the pupil however soon disappears, the pupillary reactions gradually become more active, and within two or three hours the pupil contracts pretty actively to light and on accommodation. Hence if the patient is examined in bright light the pupil will seem to have returned to its normal size, and hence the fallacious statements of several observers that the dilatation disappears in two or three hours. It will be found, however, that if the patient is examined in subdued light a perceptible dilatation of the pupil exists from eight to twelve hours after the instillation of the drug.

In testing the duration of the dilatation of the pupil, the only exact method is by instilling a drop of euphthalmin into one eye and leaving the other one unaffected to serve as a standard of comparison. If the euphthalmin is instilled into both it is very difficult to say exactly when the pupils have returned to normal. This no doubt is another reason why nearly all the observers quoted have given much too short a time for the return of the pupil to its normal state. If the observation is made with the precautions above mentioned, it will be found that the pupil takes from eight to twelve hours to return to the normal. This dilatation of the pupil in itself, however, causes the patient no inconvenience.

The great advantage of euphthalmin as a mydriatic is that it weakens the accommodation only to a slight extent, and that even this paresis of accommodation passes away completely in from one hour and a half to two hours from its first instillation. It has been stated by some observers that euphthalmin has no perceptible influence on the accommodation, but my experience is entirely opposed to this. Having made a large number of observations specially bearing on this point, it was found that in every case a distinct and appreciable loss of accommodative power was observed. Within ten minutes after the first instillation an appreciable lowering of accommodative power was observed, which gradually increased until it attained its maximum in about an hour. This paresis then gradually passed off, until the normal accommodative power was regained in about an hour and a half to two hours after the first instillation. It is the transient character of the effect on the accommodation which has led some observers into error. The accommodative power must be examined at frequent and short intervals of time in order to trace the effect of the drug. In my observations, the patients were examined every ten or fifteen minutes.

After making a very large number of observations it was found that whilst in every case euphthalmin had an appreciable effect in diminishing the accommodative power, yet the amount of visual disturbance produced by it varied very considerably in different cases. In many cases the visual disturbance was so slight as to cause scarcely any inconvenience, the patient being able to read the smallest test types during the whole time, but conscious that the eyes became easily tired on continuous effort. But even in these cases an appreciable paresis of the accommodative power was observed by the gradual shifting back of the punctum proximum up to a certain point, and then a gradual return to normal. Here is an illustrative case :—

Patient with normal refraction and punctum proximum at 2½ inches.
15 minutes after euphthalmin ; „ „ „ 3½ „
30 „ „ „ „ „ „ 4 „
45 „ „ „ „ „ „ 5 „
60 „ „ „ „ „ „ 7 „
70 „ „ „ „ „ „ 5 „
100 „ „ „ „ „ „ 2½ „

During the whole time the patient read Jaeger No 1.

In many cases this shifting back of the punctum proximum and the eye becoming easily fatigued on continuous effort were all that could be observed.

In other cases the visual disturbance was much more pronounced, the patient for a short time being able to read only the very largest test types, but here too the disturbance was very transient, and the return to normal vision was rapid. In hypermetropic and astigmatic patients the paresis of accommodation caused a much greater disturbance of visual acuity than in patients with normal refraction.

Patient with 3 D. of hypermetropia	reads	Jaeger	No. 1 at 4 inches.
15 minutes after euphthalmin	,,	,,	No. 1 at 7 ,,
30 ,, ,, ,,	,,	,,	No. 4
45 ,, ,, ,,	,,	,,	No. 8
60 ,, ,, ,,	,,	,,	No. 14
75 ,, ,, ,,	,,	,,	No. 14
100 ,, ,, ,,	,,	,,	No. 6
125 ,, ,, ,,	,,	,,	No. 1 at 6 inches.
150 ,, ,, ,,	,,	,,	No. 1 ,, 4 ,,

Patient with 3 D. of astigmatism	reads	Jaeger	No. 1 at 4 inches.
15 minutes after euphthalmin	,,	,,	No. 4
30 ,, ,, ,,	,,	,,	No. 6
45 ,, ,, ,,	,,	,,	No. 10
60 ,, ,,	,,	,,	No. 10
75 ,, ,, ,,	,,	,,	No. 4
100 ,, ,, ,,	,,	,,	No. 1 at 4 inches.

Apart from the condition of the refraction, however, the drug seems to act on the accommodation with a very varying degree of intensity in different individuals, in some producing only a slight paresis of accommodation—as evidenced by the gradual shifting back of the punctum proximum—in others producing a much greater lowering of the accommodative power, as evidenced by the gradually increasing inability to read the smaller test-types, until the patient could read close at hand only the very large test-types. In all cases, however, the disturbance of vision was very transitory, the vision becoming normal in from one hour and a half to two hours.

One of the great advantages of euphthalmin is that it seems to have no effect on the eye whatever beyond its mydriatic effect and this very transient paresis of the accommodation. Patients never complain of any feeling of smarting or irritation when it is dropped into the eye, nor do they ever make the slightest objection to a second or third repetition of the drops. No injection of the conjunctival vessels or lacrymation is observed after its use. The cornea retains its polish and brilliance, nor is it altered in any way even on using the strong 10% solution. It does not elevate the tension of the eye, and no toxic symptoms have ever yet been observed from its employment.

In all cases where a contracted pupil interferes with the thorough exploration of the fundus, or where we wish to secure a maximum dilatation of the pupil in order to examine the transparency of the media, we have in euphthalmin a mydriatic which can be used without hesitation, knowing that its use will be attended with little or no discomfort to the patient, at most, perhaps, a slight transient weakening of the accommodative power.

In estimating errors of refraction, it is of course preferable to paralyse the accommodation with homatropine or atropine, but where this is not practicable the dilatation of the pupil produced by euphthalmin is of great service in estimating the refraction by retinoscopy. I have found it especially helpful in working out cases of astigmatism by the shadow test, when the patient would not allow the use of atropine or homatropine.

Darier[5] suggests the use of euphthalmin in doubtful cases where it is desired to ascertain if iritis is present. In these cases, if one has really to deal with an iritis, atropine will have no ill effect ; but if, on the contrary, the case is one of simple peri-corneal hyperæmia, &c., one will have caused eight or ten days of paralysis of accommodation, whereas, if dilatation had been effected with euphthalmin, quite as accurate a diagnosis could have been made without causing any of the inconveniences following atropine.

With regard to price, which is an important consideration in hospital practice, this has been considerably reduced and at present it is one fifth of the price of homatropine. But since the euphthalmin solution employed for the dilatation of the pupil is five times the strength of the homatropine solution employed for the same purpose, the solutions when made up are identical in cost. When we consider that two or three minims of the 5 per cent. solution are quite sufficient to produce a maximum dilatation of the pupil, it is evident that the cost of the drug does not debar it from being used even in hospital practice.

We will, in conclusion, briefly sum up the chief qualities of this new mydriatic :—

(1) Two or three drops of the 5% solution of euphthalmin will dilate the pupil fully in from twenty to thirty minutes.

(2) This dilatation may be considerably accelerated by the preliminary instillation of a drop of 1% solution of holocaine.

(3) There is produced a paresis of accommodation, variable in amount but always of a very transient character, passing off completely in from an hour and a half to two hours.

(4) There is no discomfort or feeling of irritation produced by the instillation of the drug.

(5) There is no injection of the conjunctival vessels, no tearing and no alteration of the cornea.

(6) There is no elevation of ocular tension.

(7) No toxic symptoms have ever been observed from its use.

(8) The mydriasis disappears completely in from eight to twelve hours.

We are yet in search of the ideal mydriatic, such as would dilate the pupil rapidly and with certainty to its maximum, would have no effect whatever upon the accommodation, would allow the pupil to return rapidly to its normal condition, and would have no other effect upon the eye. Euphthalmin, although it does not completely fulfil all these conditions, yet approximates to them more closely than any other mydriatic hitherto used in ophthalmic practice, and will therefore prove a very valuable addition to the pharmacopœia of the ophthalmologist.

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An American Text-Book of Diseases of the Eye, Ear, Nose and Throat. Edited by G. E. DE SCHWEINITZ and B. ALEX. RANDALL. *Philadelphia : W. E. Saunders*, 1899.

Of this volume of 1,250 royal octavo pages, about 620 pages are devoted to Diseases of the Eye. This part is the work of thirty-three different authors, yet it is as systematic and as free from serious omissions or overlappings as most books of single authorship. Each chapter bears the impress of the individual views and style of its author or authors, yet in the thoroughness of the editing it is unique among books of the kind. The book is well illustrated, many of the engravings and coloured plates being new.

The greater part of the work is suited to the needs of the student and general practitioner in the way of a text-book and book of reference; but a few of the articles include more of interest to the ophthalmic surgeon, or go more deeply into their subjects, than the average medical man will care to follow them. This is especially true of the articles on the "Embryology, Anatomy and Histology of the Eye" (70 pages), by Geo. A. Piersol, and that on "General Optical Principles" (40 pages), by W. S. Dennett and C. W. Cutler. It must be noted, however, that nearly every chapter contains a good deal of interest to the ophthalmologist; for, regarding each subject we find here reflected the latest literature and the views now current among the most progressive students of ophthalmology.

TRANSACTIONS OF THE HEIDELBERG OPHTHALMOLOGICAL SOCIETY, 1898.

SECOND NOTICE.

RAEHLMANN (Dorpat). *Marginoplastic with Transplantation of Buccal Mucosa for Trichiasis.*—Raehlmann excises all the misplaced cilia, and then transplants mucous membrane from the lip, the "flap" amounting to 1 cm. by 3 cm. The operation succeeds in 98 per cent. of the cases; and no operation which does not actually excise the offending cilia is certain to effect a permanent cure.(!) The rest of the paper is devoted to a description of the microscopical appearances in the transplanted mucous membrane after the lapse of five weeks. In a certain number of the cases the mucous membrane retains its histological characters unaltered, and in the remainder it assumes the characters of the neighbouring (conjunctival) tissue.

C. HESS (Marburg). *Intra-ocular Pressure during Accommodatoin.*—It has been held that the intra-ocular pressure is increased during accommodation. The advocates of Tscherning's theory of accommodation hold that the pressure in the vitreous rises while that in the anterior chamber sinks. Hess has endeavoured already to show that the pressure is the same in vitreous and anterior chamber during accommodation by demonstrating the sinking downwards of the lens. He now in conjunction with Heine tries to settle the question experimentally as to whether intra-ocular pressure is or is not increased in accommodation. His first conclusion is that dogs, cats, and rabbits have hardly got any accommodation to speak of. The strongest stimulus does not produce more than at most 3 D. of accommodation in dogs and cats, and in rabbits the effect is even less.[1] Experiments must be made on apes if any conclusions are to be drawn as to human eyes. In macacus rhesus from 10 to 12 D. of accommodation can be observed. Pigeons also exhibit 12 D. of accommodation. The pressure was measured by Hoeltzke's double manometer, and it was the pressure in the anterior chamber that was taken. In non-curarised animals all the external muscles must be separated from the globe, and in curarised animals note must be taken of the periodic variations in blood pressure which may complicate the experiment by occurring simultaneously with the stimulus to the ciliary muscle. If these precautions be observed no increase of intra-ocular pressure is caused by ciliary contraction. Incidentally Hess examined the effect of the sympathetic on pressure and refraction, and found it *nil*. The above experiments were performed on cats and dogs. Similar experiments on apes and pigeons showed marked accommodation and no change whatever in intra-ocular pressure.

In the discussion Schoen observed that he did not think Hess's conclusions were justified, and even if they were they did not support Helmholtz' theory, which postulated a higher pressure in the vitreous than in the anterior chamber as a normal condition, this inequality being removed in accommodation by a rise in the pressure in the aqueous. Schoen's theory requires a somewhat higher pressure in the vitreous normally with a slight rise during accommodation, while the pressure in the aqueous does not require to be altered at all during accommodation, or, if any change occurs, it is in the direction of reduced pressure. Finally, Schoen remarked that the descent of the lens as observed by Hess in accommodation is not opposed to his theory.

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[1] On this subject see OPHTHALMIC REVIEW, 1898, pp. 255, 272, and 287.

A. v. HIPPEL (Halle). *A Case of Total Colour Blindness.*

W. UHTHOFF (Breslau). *A Case of Congenital Colour Blindness.*

E. PFLUEGER (Bern). *A Case of Total Colour Blindness.*

All three cases were congenital, and the results of the investigations into the three cases are almost identical. Pflueger's conclusions are briefly—total colour blindness is associated with diminished visual acuity, the feeling of dazzling (Blendung), and nystagmus. The other cases had the same symptoms. The light sense of the totally colour blind is centrally as great as that of the normal eye ; in the periphery distinctly greater. The red end of the spectrum appears shortened, and the brightest region of the spectrum lies in the green. This in all three cases. Among equivalent colours green possessed the greatest brightness, in correspondence with Hering's theory. The effect of coloured rays is the same as of their white equivalents (Weissvalenzen) on the normal adapted eye. No central scotoma is to be found. The diminished sensibility of the centre of the retina in diminished light can be demonstrated as in the normal eye. Peripheral vision diminishes towards the periphery just as in the normal eye. The effects of "successive contrast" are quite the same as in the normal eye.

All the principal points stated as above in Pflueger's case were observed in the two others. It is obvious that these cases do not lend any support to the view that the lesion in such cases is an absence or defect of the cones. All three cases were without central scotoma, and had the same lessened sensibility of the centre in diminished light that is seen in the normal eye, and also a rapidly diminishing acuity from the centre towards the periphery. In

Uhthoff's case excentric vision increased from the periphery to within 7 degrees from the fixation point and did not then further increase, but no central scotoma was present. Uhthoff's patient also had a curious acoustic symptom. The same tone appeared to be higher if its intensity was increased.

In the discussion Lucanus mentioned a case of total colour blindness which recovered completely, and which he considered to have been of central origin. Leber observed that there is a good deal to be said in favour of the view that the congenital colour blindness, too, is due to a central lesion. It is complicated with defective vision and nystagmus. Now, in ordinary hemianopsia colour blindness often remains after recovery. It is quite possible that in fœtal life a double lesion of the visual centre may occur, and leave afterwards only an incomplete amblyopia with colour blindness. If such an event occurred the result would be congenital colour blindness as usually observed. Of course no such hypothesis can be used to account for cases of unilateral colour blindness.

H. SATTLER (Leipzig). *Primary Extraction of the Lens in Myopia.*—For some time past Sattler has been following the practice of Adolf Weber in extracting the transparent lens without discission in high myopia, and he expresses himself as thoroughly satisfied with the result. He follows Weber's method almost exactly, using the hollowed lance, the sharp hook, and a small bent wire loop. The lens substance is separated as fully as possible from the posterior as well as the anterior capsule by means of the sharp hook, and is then extracted by pressure or by scoops. Sattler considers this method superior to the usual discission and linear extraction inasmuch as the convalescence is shorter, the healing more uncomplicated, especially by the absence of glaucoma, the number of operations on a case diminished, and the subsequent astigmatism less marked. Sattler observed that Vacher has always done immediate extraction in myopia.

L. LAQUEUR (Strassburg). *Homonymous Hemianopsia with Autopsy.*—The case occurred in a man of over 60 years of age who had suffered for some years with chronic nephritis and arterial sclerosis without evident valvular disease. The hemianopsia occurred suddenly with severe headache but with no other symptoms. It was left-sided. In the right eye the demarcation line ran strictly vertical, and in the left it bent over towards the defective side about two degrees. Slight peripheral contraction of the right fields existed in both eyes, and colour vision was normal. No change occurred for a month, when sudden blindness came on which was followed by headache, vomiting, and loss of consciousness. Examined two months later, central vision in right eye was $\frac{2}{5}$, in left eye $\frac{5}{9}$, and colour vision normal. Fields extremely contracted, measuring from one to one and a-half degrees horizontally, and from two to two and a-half degrees vertically in each eye. No signs of optic atrophy. Pupils reacting to light in both sides of the fields. No psychical defect except complete loss of sense of topography. Diagnosis was approximately symmetrical softening of both occipital lobes in region of calcarine fissure. *Post mortem*, there was found in the second branch of the art. cerebri post. on the left side, an impervious portion of 4 mm. length. No such obliteration was found on the right side. On the left side the cuneus, gyrus lingualis, and fusiformis were softened, and on the right the first two only and these only partially.

This case agrees generally with Henschen's views, but it does not enable us to decide the interesting question of the precise locality of the macular centre itself in the region of the calcarine fissure.

W. SCHOEN (Leipzig). *Pathological Anatomy of Glaucoma Prolapticum Anatomicum.*—In support of his views and in opposition to v. Hippel's, Schoen exhibited a number of microphotographs showing the changes which he finds in the histological appearances of the ora serrata in eyes of various ages, both normal, and affected with glaucoma prolapticum anatomicum.

F. DIMMER (Innsbrück). *The Path of the Optic Nerve Fibres.*—The death of a man six weeks after enucleation of an eye which could see and possessed a normal fundus permitted Dimmer to study the path of the degenerated fibres by Marchi's method. The investigation gives another proof of the semidecussation of the nerves in the chiasma, the course of the fibres being more in accordance with Bunge's view than Henschen's, in that only uncrossed fibres were found in the lateral parts of the chiasma. In the tract the crossed fibres lay ventrally at the free border as is admitted by most authorities. The degeneration higher up was almost restricted to the corpus geniculatum externum, and Dimmer found then that in the stump of the nerve itself a large number of nerve fibres were still intact, so that he concludes that in the space of six weeks only a portion of the opticus fibres become destroyed, namely, those connected with the corpus geniculatum externum.

J. v. Michel (Wuerzburg). *Thrombosis of Central Artery.*—Four cases are given, and the author distinguishes four types of thrombosis of the retinal artery. (1) Due to narrowing of the vessel from arterio-sclerosis. (2) The thrombus of marasmus, as in contracted kidneys and fatty heart. (3) Pressure thrombosis as seen in the optic neuritis accompanying intracranial disease. (Michel's case was one of cerebellar tumour.) (4) The septic or toxic thrombosis.

H. Wintersteiner (Vienna). *Nævus and Sarcoma of Conjunctiva.*—Pigment spots are not so very uncommon in the conjunctiva, but their histology has been little investigated. The author has examined a large number, and finds the usual condition to be that found in nævus pigmentosus. Unpigmented nævi occur also in the conjunctiva, and the nævi found may be adenomatous, "nævus (pigmentosus) glandulosus," or cystic "nævus (pigmentosus) cysticus." Clinically these nævi are interesting as forming the starting point for sarcomatous tumours. The latter develop from nævi usually situated in the exposed portions of the conjunctiva rather than from those better protected from external irritation.

K. Baas (Freiburg). *The Origin of Phlyctenular Keratitis.*—This is attributed by Baas to a diseased condition of the tissue rather than to a primary ectogenous infection in the ordinary sense of the terms. The process, according to his microscopic observations, commences by a lesion on the inner surface of Bowman's membrane, which is invaded by an inflammatory tissue consisting at first mostly of round cells, and bringing blood vessels with it. The epithelium at first intact is invaded from behind also, and the characteristic ulcer and resulting cicatrix produced.

In the discussion Leber observed that his investigations, though not yet completed, do not support the view that phlyctenular conjunctivitis is an ectogenous affection produced by some coccus.

G. Abelsdorff (Berlin). *The Eyes of Malays, Mongols, and Negroes.*—Ophthalmometrical measurements of thirty-five eyes of "Kirgisen," and ten eyes of Togo negroes show no definite variation in the radius of the corneal curve from the European eye, and show a small percentage and a low degree of corneal astigmatism. Only one instance of myopia was found among nineteen natives of Java, and none among the Togo negroes or those from Ashantee. Opaque nerve fibres were found twice in thirty-three Ashantees.

A. Groenouw (Breslau). *Bacteriology of Ophthalmia Neonatorum.*—In forty cases examined, including simple catarrhal ophthalmia of infants as well as purulent ophthalmia, Groenouw found gonococcus fourteen times, but only once by itself. Staphylococcus albus was almost always present, too, xerosis bacillus rarely absent, staphylococcus aureus found in about half the cases, once pneumococcus, and six times bacterium coli, besides other undetermined bacilli. Pneumococcus was found in five cases. The ophthalmia induced is milder and shorter in duration than that caused by gonococcus. As regards a staphylococcus conjunctivitis, all Groenouw states is that in one case of the forty he found an almost pure culture of staphylococcus pyogenes aureus. The white staphylococci were frequently found, but, as they are often present in healthy eyes, the ophthalmia cannot be ascribed to them. In one case a microbe resembling the micrococcus luteus of Leamann and Neumann was the only microbe present. Bacterium coli was found in six cases, which differed somewhat from the bacterium coli commune of Escherich. Others have already observed ophthalmia from this bacterium, as well as urethritis. About one-third of the cases gave no typical bacteriological appearance.

In the discussion, Leber called attention to the improbability of such a characteristic disease as gonorrhœal ophthalmia being produced by a number of different microbes. In this view he was supported by v. Hippel and Hirschberg, but opposed by Uhthoff, Axenfeld, Bach and Franke.

In addition to the above papers there were a number of patients and specimens exhibited, of which may be mentioned two cases of acromegaly by Praun; congenital total cataract by Hess, who regards the cataract in the case as being zonular originally; congenital melanosis of conjunctiva by Leber; specimens demonstrating the musculus dilatator pupillæ by Grunert; sections from highly myopic eyes by Heine; examples of diseases of the retinal vessels by Reimar; celluloid protecting "glasses" by Weiss; stereoscopic corneal microscope by Schanz; and some other instruments and cases.

The following papers were taken as read :—

C. Addario (Catania). *Effect of Injections of Corrosive Sublimate on Contents of Anterior Chamber.*—The author decides after experiments that the amount of the salt in the aqueous after subconjunctival injection is less than 1 in 100,000.

Th. Axenfeld (Rostock). *Luxation and Tearing Out of the Eyes in Lunatics.*

H. Wintersteiner (Vienna). *Cysts and Concretions of Conjunctiva.*

F. Schanz (Dresden). *Xerosis Bacillus and the Non-*

Poisonous Loeffler's Bacillus.—These organisms are to be regarded as identical.

E. LANDOLT (Paris). *Notes on Muscular Advancement.*

W. SCHÖN (Leipzig). *Etiological Treatment of Glaucoma.*

J. B. S.

FRENCH SOCIETY OF OPHTHALMOLOGY. CONGRESS, 1899.

SECOND NOTICE.

Benign Cystic Tumours of the Lacrymal Gland (*Dacryops*). M. SOURDILLE (Nantes).—A careful examination was made of a cyst of the gland, and also of the gland itself, and the results are opposed to the theory of retention pure and simple, and to that of mucous degeneration.

The dacryops appeared to arise from an ascending infection of conjunctival origin, traumatic or otherwise, affecting first the terminal portion of the excretory ducts of the gland of Rosenmüller, and then gradually extending to the acini themselves. Under the influence of this infection the inflamed duct walls lose their resistance at the same time that the irritated glandular epithelium secretes in an exaggerated degree. Secretion becoming more abundant than excretion, there is relative retention, and the enfeebled duct walls dilate, giving rise to a cyst. The cyst may remain open a long time and discharge itself, not being then a true cyst, but only a cystic dilatation of the duct. By gradual sclerosis around the duct the conjunctival orifice is first narrowed, and then obliterated, and a cyst is definitely formed. This is a simple dacryops as distinguished from the other form known as a fistulous dacryops. The acini dilated by the accumulated liquid, and surrounded by sclerosed tissue, slowly atrophy, the process tending to terminate in an atrophy with sclerosis of the whole glandular lobule. Dacryops may then be spoken of as the result of chronic dacryoadenitis.

MM. de Wecker and Lagrange made some remarks.

Ophthalmoscopic Lesions in Lepers. M. Trantas (Constantinople).—In examining systematically with the ophthalmoscope a certain number of lepers, lesions of the fundus with or without other ocular lesions (sclero-corneal lepromata, irido-cyclitis) were found in ten cases. In the larger number there were only several isolated spots, white or black, frequently not surrounded with pigment, under the retinal vessels, towards the region of the ora serrata, and not causing any functional trouble. But sometimes there were serious lesions. Thus, in a patient aged 30, there was a large number of pigmented or atrophic spots towards the periphery. In one eye there was an atrophic area in the macular region three times the size of the disc; moreover, there was a white mass in the vitreous, hiding the retinal vessels, and with white filaments extending from it. This condition, which is none other than retinitis proliferans, should be looked upon as the result of an old hæmorrhage; it being known that lepers have vaso-motor troubles, and a tendency to hæmorrhages and scurvy. The author has seen hyphæma in a leper; and in another simple opening of the canaliculus was followed by abundant hæmorrhage. He has often noted posterior staphylomata without the patients being myopic. One leper had a capsulo-lenticular cataract which has been operated on with success, so that the operation is not contra-indicated in leprosy. In another case a large sclero-corneal leproma was dissected away, the surface scraped and covered with conjunctiva, healing taking place in eight days. Choroidal trouble preceded iritis by eight months in one case, extension being opposite to the rule.

The patients presenting no other diathesis, these lesions could not be attributed to anything but leprosy, a disease having a close relationship with syphilis and tuberculosis. These choroido-retinal lesions were purely leprous, for Hansen's microbe was found. If the fundus could always be examined in cases of ocular leprosy, these lesions would often be seen, but pupillary occlusion and keratitis prevent an examination. Ocular lesions when they exist will serve in the differential diagnosis between leprosy and syringomyelia, an affection which does not give rise to choroidoretinal lesions.

M. Antonelli could confirm what M. Trantas had said, thanks to a case he had followed for some time in the practice of Professor Tournier. This patient now had corneal sclerosis, leproma of the iris and commencing cataract, and the fundus could not be examined. Several months ago, when he was still free from subjective symptoms, there could be seen choroido-retinal atrophy around a pale disc, diffuse choroido-retinal pigmentary disturbance, and several small spots of chronic choroidoretinitis, the analogy of these lesions to the rudimentary spots of congenital or acquired syphilis being striking. He insisted on the importance of ophthalmoscopic examination in all cases of leprosy.

M. Morax held that deep ocular lesions were rare and of only slight importance in cases where an examination could be made, the anterior lesions being always the first in date, and very soon rendering ophthalmoscopic examination impossible.

A Case of complete regeneration of the Cornea after entire sloughing following Purulent Conjunctivitis in a Female, aged 60. M. Armaignac (Bordeaux).—The purulent conjunctivitis followed a purulent coryza and was accompanied by hypopyon, an extensive perforation of the cornea with almost complete sloughing and a large prolapse of iris. Vision was reduced to bare perception of light. At first solution of silver nitrate (2 per cent.) was applied daily and sublimate lotion (1-2000) used. These were replaced on the third day by solution of potassium permanganate (2 per cent.) The purulent conjunctivis quickly got well, but the iris prolapse persisted for more than three weeks, at the end of which time a vascular circle formed around the margin of the cornea which was the beginning of its complete regeneration. In a month the whole cornea was reformed of normal thickness and shape and without anterior synechia or leucoma. The new cornea was in great part transparent and only presented several spots of varying thickness and extent, but which did not prevent it clearing in such a manner that six weeks after the commencement of the pericorneal vascularisation vision reached $\frac{1}{20}$, and that in spite of a partial occlusion of the pupil by an exudation from iritis whilst the cornea was sloughing. Immediately after the cure of the purulent conjunctivitis drops of picric acid (1 per cent.) were instilled, to which in great part the author attributes the regeneration of the cornea. In analogous cases of extreme iris prolapse he prefers antiseptic treatment to excision or cauterisation.

Antiseptic Injections and Irrigations of the Anterior Chamber. M. Tage (Amiens).—To effect intra-ocular antisepsis subconjunctival injections are not sufficient; it is necessary to introduce the antiseptic into the globe. In abscesses of the cornea, often complicated by hypopyon, the author has injected 2 or 3 drops of a solution of cyanide of mercury (1-10,000) into the anterior chamber with very good results, and without accidents or complications. When the hypopyon is very abundant, and when there is a commencing panophthalmitis he does a large paracentesis and washes out the anterior chamber.

M. Abadie had a very good result in a case of infection following discission by opening the anterior chamber and washing it out with sublimate solution.

M. Valude in cases of post-operative infection prefers bathing the eye five or six times daily with sublimate solution (1-1000). He had cured many cases by this means, and he mentioned two in particular.

MM. de Wecker and Parent held that intra-ocular injections injured the endothelium, whose vitality was already depressed.

The Present Phase in the Treatment of Detached Retina. M. de Wecker.—Puncture, incision, drainage, aspiration, electrolysis, injection of iodine, &c., scarcely deserve mention, representing as they do errors of treatment now abandoned. Recent researches which ascribe detachment to elevation of the retina by exudation will probably in their turn suggest a line of treatment. The surgical methods which have been hitherto proposed for cure of this dreaded affection are precisely those which tend to provoke it. Following Raehlmann's diffusion theory, the author used to inject salt solution under the conjunctiva and beneath Tenon's capsule. He changed this first for sulphate of soda, and later for solution of gelatine. All cases treated were more or less transiently improved. In treating detachment, injury should not be caused by inopportune intervention, nor should sacrifices be imposed which are disproportionate to the therapeutic result. In addition to the gelatine injections he administers mercury, and where the patient's circumstances permit he orders rest in bed.

M. Dor said that cures were generally spontaneous ones. He recommended dorsal decubitus for two months combined with other treatment.

M. Morphous detailed a case of almost complete detachment in a woman, aged 67, which was cured in a month by dorsal decubitus, blood letting, mercurial inunction, repeated laxatives, iodide of potassium, and cauterisation of the sclerotic repeated about once in six days. The vision was $\frac{2}{3}$ after the correction of a moderate myopia. Six years later vision remained the same and detachment had not reappeared.

In reply M. de Wecker said that the practical conclusion of his paper was that it was better to do nothing than to operate.

Delirium following Cataract Operation. M. Ch. Garude (Marseilles).—Cases were related affecting alcoholic patients, insane patients, as well as the larger class of those who were neither alcoholic nor insane, but merely aged. The practical conclusions were that we should not be more rigorous in our after treatment than is absolutely necessary.

Radical Cure of Palpebral Lupus by Excision of the Affected Skin and its Replacement by a Skin Flap taken from a Distance. M. de Gouvea (Paris).—A patch of primary cutaneous lupus occupying more than half of the upper lid of a young girl was completely excised down to the aponeurosis, and the raw surface was filled by a skin flap taken from the upper and anterior part of the thigh, which took most satisfactorily. The result has remained good for more than a year. The author gives the following conclusions: (1) That in palpebral lupus the excision of the affected portion of skin followed by immediate grafting is the treatment par excellence; (2) That where the lesion is limited, transplantation of a flap taken from a distance will give the best results.

Contribution to the Study of Tuberculosis of the Conjunctiva. M. Vicasse (Toulouse).—Tuberculosis may present itself as an ulcer, an infiltration, or a polypus. The first two forms can be easily diagnosed clinically, especially when there is lupus of the face. Treatment requires removal of the whole of the affected conjunctiva, followed by cauterisation.

A Case of Glioma of the Retina—Enucleation—No Recurrence. M. Destaux (Angers).—This was a case of glioma, certainly endophytum, and perhaps at the same time exophytum, commencing from the optic nerve. The extension in the nerve followed the axis cylinders and not the inter-fascicular septa.

Unilateral Hæmorrhages into the Vitreous Disappearing and Recurring Frequently for Sixteen Years. M. Jacqueau (Lyons).—The patient, aged 28, has been affected since the age of 12 years with hæmorrhage into the left vitreous, occurring at least once a year. It is absorbed each time with remarkable facility, and leaves the vision and fundus intact. The author was at first very exercised to find a cause for this hæmorrhage. There were no lesions of the fundus of the eye, no congenital abnormalities, no hæmophilia, no cardiac mischief. The urine during the attacks was normal except for an excess of urea, and especially phosphates. The author believes that this case corroborates those published by M. Trousseau from the point of view of the pathogeny of these so-called spontaneous hæmorrhages, and which in the absence of other causes ought to be considered as due to phosphaturia and azoturia. It is possible that excess of oxalates may have a certain pathogenic value, and they were slightly in excess in this case. The patient attributes the rapid resorption of the hæmorrhage to a hot foot-bath, as after the foot-bath the blood commenced to disappear and the vision to return, a fact which the author has himself verified. *Apropos* of this curious case, the author has collected fifty-three cases of so-called spontaneous hæmorrhage of the vitreous from the Ophthalmological Clinique of the Hôtel-Dieu of Lyons, and the following is a *résumé* of his conclusions. Spontaneous hæmorrhage of the vitreous is by no means most frequent in adolescence, as is usually believed. It occurs between the ages of 20 and 30, and also at 50. Between the ages of 30 and 50 it is much less frequent. In youth it distinctly preponderates in the male, then the difference for the sexes gradually becomes less, and from the age of 50 it affects males and females equally. Bilateral in youth, it tends to become unilateral between 30 and 40, and in aged persons it is usually unilateral.

Pneumococcal Cellulitis of the Orbit in a Child following Influenza. M. LEFRANÇOIS (Cherbourg).—Secondary complications of influenza are frequent, but are rarely due to the influenza microbe solely, which acts by rendering the tissues more susceptible to other micro-organisms. This affection is a very rare complication, and the author only knows of one other case, reported by Fuchs.

A Case of Purulent Ophthalmia in an Adult Cured by a Concentrated Solution of Permanganate of Potash. M. VIAN (Toulon).—Permanganate of potash solution (1-10) was applied to the palpebral conjunctiva twice daily, concurrently with hot poultices every two hours, or oftener, and hot boric lotion. At the end of the sixth day, suppuration being much less, the permanganate of potash was only applied once, and it was discontinued on the tenth day, suppuration having ceased.

A New Bifocal Lens. M. BORSCH (Paris).—This bifocal lens consists of a central lens, a nucleus, so to speak, which is achromatic, and is placed between two other lenses which by their combination furnish refraction for distance, whilst the nucleus, combined with the other two glasses, gives correction for near vision.

Cases of Night-blindness Cured by the Ingestion of Sheep's Liver. M. Trantas (Constantinople). — Hippocrates is known to have treated night-blindness by administration of ox liver in quantity. A series of ten cases, some of them serious, treated with great success by the administration of 200 grammes a day of cooked sheep's liver, has convinced the author of the real efficacy of the Hippocratic treatment. [We hope to give a brief notice of this paper in an early issue.—Ed.]

Congenital Fistula of the Cornea. M. A. Terson (Paris).—This was a rare case of congenital fistula in the centre of the cornea. There was no anterior chamber, the iris was adherent to the margins of the fistula and the aqueous humour flowed away in a constant stream. The fistula closed three weeks after birth and the eye has since then shown a tendency to increased tension, necessitating operation. The etiology is not absolutely clear, but it appears to result from an intra-uterine corneal ulceration rather than from an arrest of development. The mother violently struck her abdomen against the corner of a table when six months pregnant.

Treatment of Keratoconus by Temporary Tarsorrhaphy. M. Kalt.—In cases of recent ectasia of moderate degree, prolonged compression by a bandage may be expected to produce flattening, but the bandage is inconvenient on account of irritating the eyelids. By paring and suturing the eyelids in order to keep up constant pressure, in one case an improvement in visual acuity of from $\frac{1}{10}$ to $\frac{1}{3}$ was obtained. The lids should not be separated for several months or a year.

Quinine Amaurosis and Amblyopia. M. Zanotti (Vercelli).—A man, aged 38, swallowed 12 grammes of sulphate of quinine, he lost consciousness thirty minutes afterwards, was taken home and attacked with general convulsions which lasted until the next morning, when he regained consciousness, and had sensation of "brilliant lightning and deafening thunder." Those round him looked like shadows. A little later in the morning his vision was completely lost. The early symptoms were succeeded by marked prostration, but no doctor was called in for forty hours. He found the pupils widely dilated and not reacting to light. There was complete amaurosis, hearing on the right side was abolished, and on the left side very much diminished; taste and smell intact. The state of stupefaction in which he found the patient persisted for six or seven days. After nine to ten days of complete amaurosis the vision very gradually returned. Zanotti examined the patient two months after the attack. The visual acuity was $\frac{1}{4}$; the field of vision was very contracted; he was blind to green, and distinguished other colours with difficulty; he had night-blindness. The pupils reacted well to light; the discs were blanched and the vessels filiform. There were small white spots with ill-defined edges scattered around the papilla and macula, having the appearance of degenerative choroido-retinal lesions consecutive to punctiform hæmorrhages. The macular region appeared normal. Two months after this examination the acuity was $\frac{2}{3}$ and the visual field was enlarged, but did not extend beyond 30°. One year later visual acuity was slightly diminished and $= \frac{3}{5}$. The white spots were still present, arteries filiform, veins dilated and visual field still contracted.

Zanotti referred to a case of quinine amblyopia in a female aged 20, under treatment for malarial choroidoretinitis, and who at each administration of ·75 centigrammes presented a diminution in vision, and a paleness of the disc with contraction of the vessels. As to the pathogeny, most authors agree that the quinine has a direct action upon the vessels, leading to retinal ischæmia.

Remarks upon the Anatomy and Pathology of the Lacrymal Passages. M. Rochon-Duvigneaud (Paris).—In the fœtus the lowest extremity of the nasal duct is curved towards the median line. In proportion as the superior maxilla develops in height the nasal canal straightens. At birth it retains something of its original curve, and it is probable that to practise catheterism in the new-born in cases of congenital dacryocystitis it might be of advantage to give to the probe a slight curve. In the fœtus and the new-born the inner wall of the nasal canal is much more sinuous and irregular than in the adults, and one meets generally annular constrictions varying in level, size and number. The author has not seen more than four and sometimes they are entirely absent. The lacrymal passages in the adult are smoother than in the new-born, representing a simplification, a more or less perfect adaptation to their function of an excretory channel. Some lacrymal canals from their irregular configuration and narrowness predispose to obstructions, others on the contrary from their size and smoothness are relatively immune. The nasal duct being derived from a cutaneous invagination does not at first communicate with the nasal fossa. Its lowest extremity terminates in a *cul-de-sac*, extending beneath the mucous membrane of the inferior meatus; exceptionally the *cul-de-sac* ends at the attachment of the turbinal, *i.e.*, at the termination of the osseous canal. The accumulation of detached epithelium in the lacrymal passages distends the closed lower end, causing it to give way. The time of perforation may be delayed till after birth, and the canal become dilated by the amount of accumulated epithelium. For the onset of dacryocystitis it is probably only necessary for some micro-organisms to get in, so that the anatomical conditions will predispose to congenital dacryocystitis.

Questions of School Hygiene. Follicular Conjunctivitis. M. DELBÈS (Périgueux).—In the examination of 2,540 scholars, 35 per cent. boys and 38 per cent. girls were found affected with follicular conjunctivitis; of these 49 per cent. boys and 53 per cent. girls had also hypertrophied tonsils and adenoids. Sixty-three per cent. boys and 70 per cent. girls had enlargement of the sub-maxillary and cervical glands; and 39 per cent. boys and 48 per cent. girls had dental malformations. The author insists upon the necessity of a systematic examination of all school children's eyes.

Section of the Cervical Sympathetic. Microscopical Study. M. DE OBARRIO (New York).—After section or resection of the sympathetic in rabbits and cats, microscopical examination of the eyes exhibited isolated hæmorrhages scattered throughout the uveal tract as well as in the retina and optic nerve. If, in addition, a further diminution of ocular tension was produced by paracentesis the hæmorrhages occurred more abundantly.

Among other papers read were :—

"The 'Open' Method of Treatment after Cataract-extraction," by M. Rohmer (Nancy).

"Suppurative Iritis after Cataract-extraction cured by Mercurial Inunction," by M. Vian (Toulon).

"Spasm of the Ciliary Muscle in Children," by M. Lagrange (Bordeaux).

"Some Combined Paralyses of the Ocular Muscles," by M. Teillais (Nantes).

"Measurement of Visual Acuity," by M. Sulzer (Paris).

"Luminous Intensity of Colours in Hysterical Achromatopsia," by M. de Obarrio (New York).

"New Method of Hetero-photometry," by M. Neuschüler (Rome).

"Myotics in Glaucoma," by M. Javal (Paris).

"Malarial Iritis," by M. Péchin (Paris).

"Can a Myopic Eye become Emmetropic?" by M. Bettremieux (Paris).

"Treatment of Detachment of the Retina," by M. Bettremieux (Paris).

L. V. CARGILL.

LETTER TO THE EDITOR.

Advancement of the Rectus Muscle.

Dear Sir,—I have just read with interest Mr. Story's paper in your July number on Methods of Advancing the Recti Muscles of the Eyeball. As I am the oculist in the Antipodes to whom he refers as having brought forward Weber's suture as my own, I must ask you for space to reply to him.

I was not familiar with Weber's stitch, and devised the one referred to by Mr. Story to obtain more simply the pulley effect of Prince's stitch. It never occurred to me to claim any *kudos* for the idea, but when I was in England in 1892 I found that the stitch was new to those to whom I showed it, and I later found that it was unknown to my Australian *confrères*. Thinking that it might possibly be of use to other surgeons, I had it laid before the Ophthalmological Society on November 12, 1896. Mr. Story wrote to me shortly after the publication of the *Transactions* saying that the stitch was not original—which did not distress me very much. It was original so far as I was concerned, and was clearly not well known.

Since Mr. Story's letter I have been under the impression that I had unconsciously covered the same ground as some previous worker, but now that he has published a description of the stitch to which he refers as Weber's I am in a position to compare it with the stitch which I described myself.

Mr. Story says that in Weber's stitch three needles are used : the centre one, double-threaded, is passed through the cut tendon from the ocular surface, and on removal leaves a loop outside the conjunctiva through which the ends of the suture, after having been passed through the episcleral points of purchase above and below the cornea, are introduced from opposite sides, and then, when the stitch has been drawn tight, are tied. Both threads of the loop passing through the same needle hole in the tendon, tightening of the stitch must tend to obliterate the loop and draw the threads passed through it to the under or ocular face of the tendon, after the fashion of a sewing machine stitch. Passing the threads through the loop and then tying them together over it when thus drawn down into the tissues must make a knot as incapable of vertical adjustment as if the loop had been cut and the halves tied up and down. Removal could only be accomplished by cutting both upper and lower threads, and then by traction on the knot drawing out the impacted threads in a direction at right angles to the plane of the tendon, at considerable risk of stretching the recent adhesions it has formed.

In my stitch only two needles are used : they are passed from the outer surface through the conjunctiva and tendon towards the globe near the upper and lower margins of the tendon, the loop therefore cannot bury itself in the tissues on tightening the suture. Only one end of the suture is passed through the loop after the episcleral purchase has been taken and the knot is below the cornea. The single thread slips readily under the loop and gives the same pulley action as Prince's stitch, with the same vertical adjustment. If the thread is cut between the knot and the loop near the loop, traction on the knot brings out the suture easily, any possible pull being on the length of the sutured muscle and not on the adhesions. The buried portions of the thread pass from the edges of the tendon to their episcleral hold, and do not lie between the tendon and the surface to which we wish it to adhere. Possibly some of the failures of Weber's stitch to which Mr. Story refers may have been due to the fact that the threads are in the best position for preventing firm adhesions forming.

I need hardly point out that it is as easy to shorten the tendon, if necessary, with this stitch to fix the shortened tendon in place, as it is with any other.

Any one can compare the two stitches easily by using a piece of thread and the buttonholes of his waistcoat; a loop passed from the under side through one buttonhole and the ends cross-threaded through it represents Weber's stitch as described by Mr. Story, the ends passed through two consecutive button holes and one end passed back through the loop thus formed represents mine. A glance at the diagrams on page 337, vol. xvii., of the *Transactions of the Ophthalmological Society* will show that if I have unconsciously followed in Weber's footsteps in using the loop I have gone a step farther than he did.

Waimoana,
High Street, *Dunedin*, *N.Z.*,
August 24, 1899.

I am, Sir,
Yours very truly,
H. L. FERGUSON.

ORBITAL TUMOURS.

By Gustavus Hartridge, F.R.C.S., &c.

Surgeon to the Royal Westminster Ophthalmic Hospital, Ophthalmic Surgeon and Lecturer on Ophthalmology to the Westminster Hospital.

Orbital tumours are among the rarest forms of disease that come under the notice of the ophthalmic surgeon; out of 2,058 tumours met with by Billroth only 18 were in the orbit, while of all patients that attend an ophthalmic hospital, tumour of the orbit does not occur more frequently than 1 in 10,000 cases. The two following cases present points of interest, and appear worthy of record :—

Daisy D——, aged 12, was brought to the Royal Westminster Ophthalmic Hospital on March 13, 1899, on account of increasing prominence of the left eye. The parents gave the following history :—The child has always had very good health, father and mother both healthy; they have three children, all well. No history of malignant disease, tubercle, or syphilis, and the mother has had no miscarriages. About the middle of November, 1898, the left eye was noticed to be more prominent than the right, there was no inflammation or pain, and no history of a blow; the condition remained about the same till December 30, when she was taken to a doctor who advised that it should be left alone, and said the child would grow out of it. The eye very slowly became more prominent, and at the beginning of February the doctor was again consulted. As the growth rapidly increased in size she was brought to the hospital. The photograph shows the appearance of the child when first seen.

Right eye normal; vision = $\frac{6}{6}$. Left eye very prominent and displaced upwards; vision = $\frac{6}{60}$. The conjunctiva is œdematous and projecting between the lids, which are stretched tightly over the globe, but just cover it; cornea clear. Disc pale, eyeball otherwise normal. There is an irregular-shaped nodular semi-elastic swelling surrounding the left globe chiefly below. The growth does not appear attached to the bone or skin, and is movable with the eye.

On March 16 the patient was placed under chloroform and the whole contents of the left orbit removed. The outer canthus was divided and an incision made from the inner canthus downwards, so that the lower lid could be turned down; the periosteum along the lower margin of the orbital ridge was divided and stripped from the bone up to the apex of the orbit, the growth with the globe being removed in one mass. The disease did not appear to invade the bone, nor extend into any of the adjoining cavities; very little blood was lost during the operation, and the orbit was plugged with cyanide gauze and covered with a pad and bandage. The dressing was changed every second day, and the child has not had the slightest discomfort; the orbit is now gradually granulating up with very little discharge. The growth when removed was found to be nodulated and completely to surround the globe and optic nerve. It infiltrated the lower muscles, especially the inferior rectus, and appeared slightly attached to the periosteum at the lower part of the orbital ridge. The growth seems to have commenced in the connective tissue of the orbit. The eyeball was normal.

Report of the Microscopical Characters, by Mr. John Griffith.—"The growth surrounds the optic nerve and

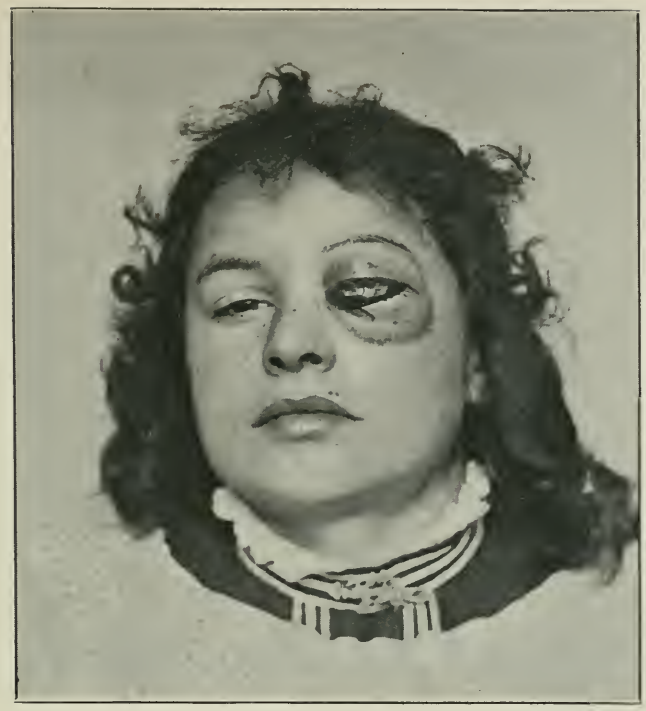

FIG. 1.—The Case of Daisy D——. Sarcoma of the Orbit.

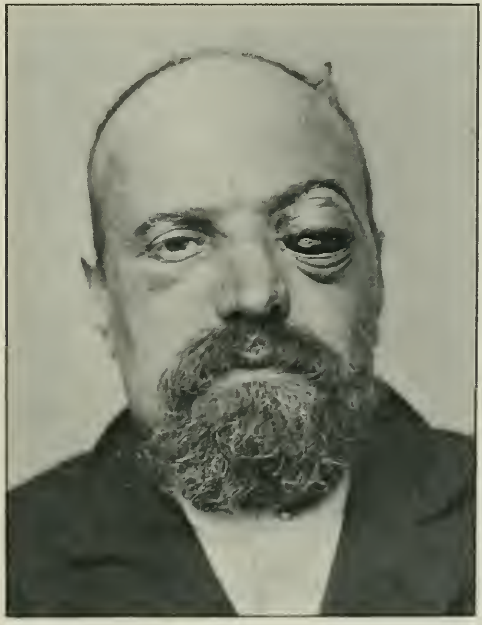

FIG. 2.—The Case of Thomas L——. Syphiloma of the Orbit.

the posterior half of the eyeball. The latter is not invaded and the nerve appears healthy. The growth is about 3cm. in its transverse diameter. It is white in section and lobulated. The microscope reveals a spindle-celled sarcoma, the bulk being composed of spindle cells; but here and there bands of connective tissue separate the lobules of sarcomatous tissue. The growth is not very vascular, and is loosely adherent to the eyeball."

The completeness with which the whole of the affected tissues were removed, the healthiness of the bone and surrounding cavities, afford reasonable hope that no recurrence will take place.

Thomas L., aged 47, was admitted into the hospital on April 7, 1899. He had always been fairly healthy; there was no history of tubercle or syphilis; had slight lead poisoning twenty-seven years ago. In August, 1890, the patient noticed that the vision of the left eye was impaired, and that he was able to see objects situated to the right but not to the left; the blind part gradually extended until the sight in this eye was quite lost. He attended the hospital, and the left eyeball was removed on November 25, 1890. On looking up the notes of the case in the case-book, we find that the globe was removed for an intraocular tumour. After the operation the patient made a quick recovery, and was able to wear an artificial eye till nine months ago, when it commenced to slip out, and after a month or two he found he could no longer retain the false eye. Four months since he first noticed a swelling in the socket, and this had increased gradually without pain or discomfort till the end of March, when it became painful and inflamed.

Urine acid, sp. gr. 1030, no albumen or sugar, loaded with urates.

On examination the lids are seen to be swollen and red; they are partially separated by a large, firm, solid mass which fills the whole of the orbital cavlty; the mass is rather hard and irregular, immovable, and not attached to the skin, which is stretched a good deal. There is a small patch of ulceration with slight bleeding at one point. The pain for the past two days has been very severe, and is referred chiefly to the back upper teeth of the same side and the frontal region of the opposite side, with a considerable amount of tenderness at the lower margin of the orbital cavity.

Four days later the growth was much larger, the lids more separated, with slight blood-stained discharge; the swelling has now extended slightly to the right lid, and the patient complains of severe frontal headaches.

Liver not enlarged; lungs, slight loss of resonance both bases with some rhonchi and râles; no hæmoptysis.

Nasal cavity.—Septum deflected to the right, but no growth to be seen in either the front or the back of the nose; no discharge from either nostril; antrum appears healthy.

On April 10 the patient was placed under chloroform, the outer canthus was divided, and the lower lid turned down as a flap by a vertical incision at the nasal side, and the whole orbit cleared out with the periosteum. During the operation the growth burst, and a considerable quantity of dark blood-stained fluid escaped; the bone was quite healthy, except on the nasal side, where the orbital plate of the ethmoid was eroded. Very little blood was lost during the operation; the orbit was plugged with cyanide gauze.

The diagnosis before the operation was that in all probability the neoplasm was a sarcoma. The presence of the blood cyst, and the small amount of blood lost at the operation, made the diagnosis somewhat uncertain, though the erosion of the bone was very suspicious.

Report on the Growth by Mr. John Griffith.—"The growth has the appearance of a large uniocular cyst with a thick wall and thick brown fluid contents. The inner lining of the cyst is rugged and irregular. A piece of the anterior wall was examined microscopically and presents the appearances of a granuloma. The wall of the cyst is about 5mm. thick anteriorly, smooth externally, and lined by conjunctival epithelium: the inner lining is rough, and consists of broken-down granulation tissue. Between the two surfaces there is a fibro-cellullar tissue permeated with blood vessels with natural walls. Fat cells are also present infiltrated with inflammatory cells. The capillaries show thickened endothelial cells.

"The general characters of the cyst wall suffice to determine that the tumour is a large granuloma which has broken down in its centre, and has thus presented the appearance of a cyst. It is, in my opinion, a syphiloma."

The case made an uninterrupted recovery without a bad symptom, and the denuded area is granulating, though a sinus still exists into the ethmoidal cells. As soon as the microscopical characters of the growth became known, the patient was placed upon a course of iodide of potassium, which he is still taking.

I am indebted for the notes of these two cases to our house surgeon, Mr. G. Constable Hayes.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

G. Anderson Critchett, M.A., F.R.C.S.Edin.,
President, in the Chair.

Thursday, October 19, 1899.

President's Address.

In his opening remarks the President thanked the Society for the honour it had done him in electing him, and paid tribute to the many eminent ophthalmologists who had preceded him. He had watched the Society ever since its first inception under their revered master, Sir William Bowman, and it was to him (the President) a life-long regret that his honoured father did not survive to occupy the chair. But though his name could not be enrolled among the Presidents of the Society, yet it must ever hold high rank amongst the great pioneers of ophthalmology, and his memory was in safe keeing with all who knew him. The President then proceeded to deal with the evolution of cataract extraction since Daviel first attempted it in 1745. Prior to that time, couching and discission were the only recognised operations. His operation was a simple extraction, and although it gained numerous adherents there were many who relied on the more primitive methods, and even as late as 1838 it was stated by Guthrie that "there are reasons which will ever prevent it being practised by the great body of the profession." The statistics, however, of cataract extractions were, notwithstanding, remarkably good. He next described in detail the old flap operation. When done with skill and success it gave an excellent result, but so often a large prolapse of iris occurred, and in these pre-antiseptic days primary suppurations were numerous. The dawn of a new era was foreshadowed at Moorfields, when it was found that the results of one of the surgeons less skilful than his fellows were exceptionally good. This gentleman, usually accidentally, did an iridectomy. The first definite change was made by Professor Schuft, whose efforts at reform were somewhat radical. He made a slit-like opening at the corneo-scleral junction, did a large iridectomy, and then inserted a spoon with which to remove the lens, but this often caused loss of much vitreous. Then in 1864 the President's late father read a paper at the Congress at Heidelberg on the excellent results achieved by himself and Mr. Bowman at Moorfields with linear extraction, and this led to von Graefe introducing the knife, still used and always associated with his name. The operation he instituted had its dangers, and without great skill and care the operator was liable to encroach on the ciliary region, and severe cyclitis and loss of vitreous were not infrequent. Numerous modifications had been made, and the most important were associated with the names of Pagenstecher, who removed the lens with a spoon in its capsule, as also did Macnamara and Andrew, of Shrewsbury. Lebrun, of Brussels, and Pridgin Teale made a purely corneal section, but anterior synechiæ and astigmatism were frequently produced. Bell Taylor removed a small portion of the periphery of the iris, and left the pupil intact, but the difficulties of the operation were serious drawbacks to its adoption. Förster's artificial ripening and McKeown's irrigation of the anterior chamber were also mentioned. Ophthalmic surgeons were now divided into two great camps; on one side were the adherents of simple extraction, while on the other were those who were loyal to iridectomy. In spite of recent advances finality had probably not yet been reached, but in the hope that our future might be one of scientific progress they should retain an open mind and a well-balanced judgment, keeping steadily in view the final goal, the relief of human suffering.

Interstitial Keratitis in Acquired Syphilis.—Mr. Lawford read notes of five cases (four males and one female). In three of the cases the evidence of syphilis was indubitable, in the other two it was open to question. In the first case the keratitis developed four and a-half months after the primary lesion, which was situated on the lower lid of the eye, whose cornea became involved. In the second case an interval of eleven months elapsed between the primary sore on the penis and the development of the keratitis. In the other three a longer period separated the primary lesion and the corneal affection. Mr. Lawford drew attention to certain features in these and other previously recorded cases, wherein they differed from the keratitis of inherited syphilis. In the acquired form the attacks of keratitis seemed to be of shorter duration and less severity, and in most instances only one eye became affected. The prognosis also seemed better, as in the majority of cases complete or almost complete restoration of the transparency of the cornea resulted. He considered that in three of his cases there was good reason to believe that the keratitis was a syphilitic affection; in the other two he merely noted the occurrence of an interstitial keratitis in patients who had probably had syphilis some years previously.

Mr. Lang said he recorded a case in the *Transactions* of the Society seven or eight years ago, in which interstitial keratitis followed a chancre of the ocular conjunctiva. The cornea cleared in about a year.

Mr. John Griffith asked whether the cases were looked upon as being a secondary or tertiary manifestation.

In reply, Mr. Lawford stated that he considered them both secondary and tertiary.

The Value of Radiant Heat in the Treatment of Eye Diseases. —Mr. Doyne read a paper on this subject. After drawing attention to the drawbacks of fomentations, which produce a soppy condition of the conjunctiva, loss of tone of the skin and consequent entropion, he advocated the use of radiant heat.

The method he employs is as follows:—The patient sits with the affected eye as near to an electric incandescent lamp as can be borne—a frosted lamp of 16-candle-power being used—for five to twenty minutes at a time, three times a week or even daily. The eyelids are kept closed and as a rule, not covered ; in a case of acute iritis the eye was covered by a pad of cotton wool. He finds the value of the treatment increased by massage and cold douching after application of the heat. Cases of chronic cyclitis and neuralgic conditions of the eye in neurotic patients he has seen greatly benefited. The pain in acute iritis has been relieved, but chronic iritis does not appear to be improved by this treatment. The face becomes very hot, and occasionally slight giddiness is complained of, but no other inconvenience has been noticed.

Recurring Superficial Necrosis of the Cornea.—Mr. Doyne also read a short paper on recurring superficial necrosis of the cornea. The above is a term which Mr. Doyne applies to the recurrent attacks of loss of corneal epithelium that occur in eyes which, years before, have been subject to strumous keratitis. He points out that these cases should be distinguished from those of recurrent keratitis. The attacks occur in eyes in which the nebulæ are superficial, at a time when the general health is lowered or after exposure to cold winds, &c. He advises the use of eserine drops to improve the condition of the cornea.

Card Specimens. Congenital Subluxation of the Crystalline Lenses. Mr. Sydney Stephenson.—In this case it could be seen that the suspensory ligament was absent from the central part of the aphakic portion of the pupil.

A Peculiar Form of Affection of the Choroid. Mr. Reginald E. Bickerton.—The patient, a man aged 29, complains of "mist and flames" before the eyes—vision in each eye is $\frac{6}{6}$ and J 1. In the macular regions there are a number of yellowish white dots, and almost surrounding the discs there is a mass of white patches, some round, others angular ; above they are separated from one another by altered choroidal tissue, below they are more confluent. The retina is slightly striated over the affected region below the disc. There is a history of scarlet fever, rheumatic fever, cough, night sweats, wasting, lupus of the ear, and stone in the kidney. No specific history.

Paralysis of the Muscles of both Eyes. Mr. Doyne.

Inflammatory Patch in the Retina (? Tubercular). Major M. T. Yarr, R.A.M.C.—The patch is situated in the R. retina between the macula and optic disc; it is slightly raised and the edges are blurred. There is marked papillitis and general cloudy swelling of the retina.

Pulsating Exophthalmos (Congenital). Mr. Rockliffe.—The child, aged 22 months, had inflammation of the eyes (probably purulent ophthalmia) soon after birth, and when recovering the mother noticed that the swelling of the lids remained, and that the right globe was prominent. This prominence has gradually increased, the child being otherwise well. On examination, the left eye is normal; on the right side there is swelling of both lids, proptosis down and in, slight ectropion of the outer extremity of the upper lid with distended veins. The amount of swelling varies. The movements are free; there is no chemosis, no solid growth, bruit, pulsation, fluctuation, tenderness, or pain, but a soft cystic growth can be felt deep in the orbit. Vision is apparently normal. Under chloroform, however, the globe is seen to pulsate synchronously with the heart, and a moniliform tumour can be felt deep in the orbit, also pulsating. No bruit can be felt. The pulsation can be partially controlled by pressure on the carotid. There is no history of injury, and no instruments were used at birth.

Mr. Rockliffe assumed it to be an arterio-venous aneurism, situated deep in the orbit, and proposed to treat it by electrolysis, and if that did not do good, to tie the carotid artery. He had had a similar case many years ago, but the child had got well with cod liver oil and iron.

The President thought there would be no harm in trying electrolysis.

Dr. Argyll Robertson mentioned two cases of pulsating tumour of the orbit which were subjected to electrolysis; in both pulsation and bruit were always present. In one case the result was perfect; in the other, the tumour was consolidated, but the eye was lost from suppurative inflammation due to exposure. He thought that the present case might be an incipient stage of pulsating tumour, in which, during anæsthesia, an increased flow of blood occurred into the orbital vessels. He advised electrolysis.

Mr. Ernest Clarke had had a somewhat similar case in 1894, but the pulsation was always present and the eye was useless. Electrolysis made the child ill for a fortnight after each sitting, and did not bring about a complete cure, though some improvement was gained.

Thursday, November 9, 1899.

G. Anderson Critchett, M.A., F.R.C.S.Edin.,
President, in the Chair.

Card Specimens. Mr. R. D. Batten: A Case of *Disseminated White Patches in the Choroid.*

Mr. Holmes Spicer: A Case of *Spring Catarrh.*

Mr. Work Dodd: (1) A Case of *Bifurcation of the Retinal Vein.* (2) A Case of *Opaque Nerve Fibres.* The opaque fibres formed a thin white streak running inwards from the disc, from which, however, they were quite separate. (3) *Intra-ocular New Growth.* The patient, a woman aged 52, first noticed last July that her sight was gradually failing. Her vision now is:—R. counts fingers at 1 m., L. $\frac{6}{9}$. T. n. in both. Ophthalmoscopic examination shows very marked detachment of the retina in the right eye, and in the upper and outer quadrant there is a large globular semi-opaque protuberance which shows a red reflex, is fairly regular, does not undulate, and when the eye is moved does not sway, and in it there are some vessels visible.

Mr. Frost thought it might be a case of a cystic rather than a solid growth; and suggested as a means of diagnosis that light should be thrown obliquely through the growth, and also that a trochar should be put into it to see if anything came out.

Tuberculosis of the Palpebral Conjunctiva and (?) *Lacrymal*

Sac, associated with Nasopharyngeal Tuberculosis. — Mr. Vernon Cargill. The patient, a woman, aged 24, had a swelling in the region of the right lacrymal sac eighteen months ago, which was opened and the nasal duct probed. Following this the right upper lid became affected with tubercular disease of the conjunctiva, which was treated very successfully with scraping and application of pure carbolic acid. The nose was also found affected with tubercular disease and treated. The left lacrymal sac has recently become swollen, but there is no regurgitation. Mr. Cargill thought that in the face of the other conditions, in all probability the left sac was affected with tubercle, and asked if it would not be the best treatment to excise the sac and thus avoid the risk of infection of the conjunctiva or elsewhere.

The President thought it would be wise to remove the left lacrymal sac.

Mr. Donald Gunn said he had had a boy under his care with lacrymal abscess and tubercular disease of the nose and soft palate. He treated and practically cured the lacrymal trouble, but a year after the patient reappeared with a large tuberculous ulcer in the middle of the upper eyelid. He had no doubt that in that case the tubercular mischief spread from the nose to the sac, and from there to the conjunctiva, so that in this case he would strongly advise excision of the sac rather than opening it.

Primary Neoplasm of Optic Nerve.—Mr. E. Treacher Collins and Mr. Devereux Marshall read a paper on two cases of primary neoplasm of the optic nerve. They exhibited also four other specimens of this variety of new growth which they had collected. Their first case was that of a boy aged 5 years, who had come under the care of one of them at Moorfields. The right eye had become more prominent than its fellow, and although treatment with iodide was tried, no improvement occurred, and it was therefore decided to explore the orbit. While under observation the proptosis had become more marked and the eye more flattened in its antero-posterior diameter, as was proved by the fact that the hypermetropia increased from 4 D. when it was first seen, to 9 D. at the time of the operation. The movements of the eyeball were but very slightly limited. When removing the eye it was found that the nerve was very much enlarged ; this was divided as far back as the optic foramen. On examination the growth was seen to be chiefly composed of the very much thickened pial sheath ; there was also a great increase in the fibrous tissue of the nerve, and the nerve fibres had almost entirely disappeared, leaving apparently empty spaces. The second case was that of a lady aged 46, whose sight had been failing for nine months. Hæmorrhages covered the retina, and the eye was quite blind. Excision was performed in November, 1897, when the optic nerve was found to be much enlarged. As malignant disease was feared, the contents of the orbit were taken away and the nerve divided at the optic foramen. In this case, as in the first, there was found to be much thickening of the pial sheath and also of the connective tissue of the nerve. There was at present no recurrence in either of them. The authors fully discussed optic nerve tumours, and drew attention to the numerous and varied names under which reported cases were described. Owing to the rarity of this form of growth but few observers had been able to examine more than one or two cases, and thus much confusion existed as to their nature. In some of their cases the growth was more fibrous, while in others it was more cellular, but in none did they find any true myxomatous changes. They believed that all their six cases were of essentially the same nature, differing only in detail. They argued that as the tumours had really commenced in the supporting tissue of the nerve, the term "glioma" was applicable. They strongly disapproved of the compound terms so frequently applied, such as "fibro-sarcoma," and as much of the confusion which had arisen with regard to the nature of optic nerve tumours was due to the nomenclature which had been adopted, they expressed a hope that this might be in a measure cleared up by pathologists recognising the essential principles observed in all these growths, the different appearances were really matters of detail only.

Mr. Rockliffe, who had supplied one of the six cases examined by the authors, stated that the health of his patient was greatly impaired before the operation, but improved directly the eye was removed. Although this was six or seven years ago, the patient remained well, with no recurrence. He thought that the sections of the different tumours shown were by no means similar in appearance, and he asked if this could be explained.

Mr. Devereux Marshall, in reply, said he had found no such impairment in health in any of the other cases, and he considered that the growths were not of a highly malignant type. He referred to a case he had brought before the Society a year ago with Mr. Bullar, in which it was certain that the growth extended further back than the part removed, and yet after several years there was no recurrence. With regard to the differences seen in the sections he admitted that at first sight such was the case, but on further examination both he and Mr. Collins were quite convinced that the difference was far more apparent than real.

Iritis, a Sequel to Gonorrhœa.—Mr. John Griffith read a paper on this subject. He was of opinion that though iritis as a complication of gonorrhœa was universally recognised, it had not received attention as a sequel of that complaint. He gave a brief account of twelve cases that had come under his care. Of the twelve, the greater number had developed iritis seven years or more after the urethritis. Syphilis was excluded in nine, and the three in which that disease had complicated the gonorrhœa, iritis had developed, which he regarded as gonorrhœal and not syphilitic. In the syphilitic subjects rheumatic troubles had occurred only subsequent to the urethritis. In nine out of the twelve rheumatism had been present, in eight of which no rheumatic attack had shown itself prior to the gonorrhœa. Mr. Griffith considered gonorrhœa on a parallel with syphilis in the liability to remote complications, and strongly upheld the constitutional nature of the affection. He was sceptical about rheumatic iritis, believing that the iritis and the rheumatism were in many instances dependent upon a previous attack of urethritis. He concluded by quoting a case of recurrent pleurisy, which he attributed to the evil effects of constitutional gonorrhœa.

The President thought that the sequelæ of gonorrhœa were very much underrated, and although he could not go so far as Mr. Griffith, yet he thought the Society was indebted to him for drawing attention to the subject.

Dr. Brailey did not agree with Mr. Griffith as to the gonorrhœal origin of iritis in many cases where it did not come on for many years after the urethritis.

Mr. Treacher Collins had once collected a series of cases of iritis, and in those which were due to gonorrhœa there was frequently a gouty history.

Mr. Lang said that iritis following gonorrhœa was by no means uncommon, and he thought that such cases frequently had the characteristic albuminous exudation in the anterior chamber, at times looking like a dislocated lens.

Mr Griffith briefly replied.

AMERICAN MEDICAL ASSOCIATION, SECTION ON OPHTHALMOLOGY,

Columbus, Ohio, June, 1899.

Chairman, Casey A. Wood, of Chicago.

Cataphoresis in Trachoma.—Geo. E. Keiper (Lafayette, Ind.) reviewed the history and theory of cataphoresis, and its applications in other departments of therapeutics. The diffusion of copper in the form of an oxychloride from a positive pole of pure copper, can be demonstrated experimentally on a piece of lean meat. For applying the method to the eye there are required a good battery of twelve to twenty cells, a milliampère meter, and suitable electrodes. After the instillation of cocaine the negative electrode is placed in the patient's hand or upon the back of the neck, and the positive electrode of pure copper gently rubbed over the everted lids; or a copper needle connected with the positive pole may be thrust into each granule. The current employed should usually be about three milliampères, and never more than five. The application should be continued for about five minutes, and is followed by some stinging, smarting pain, which is quickly allayed by the application of cold water to the closed lids.

L. Howe (Buffalo) was surprised at the strength of current employed, since he found that patients winced under a current of one and a-half milliampères. In repeated experiments he had been unable to demonstrate any diffusion of the medicament into the tissues.

Seeing the Capillary Circulation in one's own Retina.—C. E. Norton (Lewiston, Maine) read a paper on the small moving bodies seen when one looks steadily for several minutes through a deep blue glass at the sky. He had first noted the movements of these bodies over twenty years ago; they are not *muscæ volitantes.* Their movement is not affected by movements of the eyes. It is jerky, like that of the corpuscles in the capillary circulation of the frog's foot. The bodies in question move along certain paths, but never back and forward along the same path. They move in toward the centre of the field, but never quite to the fixation point. Then they turn and pass off toward the periphery.

Nutrition of the Lens and Cataract.—L. Stricker (Cincinnati) believes that the nutrition of the lens, like its increase, depends on its anterior layer of epithelial cells, and that they constitute the principal barrier to the inroads of disease. If the resisting power of these cells be overcome, lens changes occur, the character and extent of which depend on the composition of the intra-ocular fluids.

Quinine Blindness in a Young Child.—H. Moulton (Ft. Smith, Ark.), reported the case of a boy, 3 years old, who had been given 90 grains of quinine in five days. He was then found to be blind, but was still given 10 grains on each of the two succeeding days, or 110 grains in all.

When seen two weeks later he was totally blind, the optic discs perfectly white, and the retinal vessels almost obliterated. Twelve weeks after the blindness commenced the child was reported to see a little. Six weeks later, when last seen, he could find and pick up pencils, and even pins, from the floor, but the fields seemed to be restricted. The pupils were still somewhat dilated, but responded moderately to light, the discs were pale, and the arteries about half their normal size.

Vision and Colour Sense of Railway Employés.—C. H. Williams (Boston) explained a plan of examination that had been put in operation under his supervision. The tests were made by selected employés, who were specially trained to conduct them. Among the tests employed were representations of the semaphore signals, as they would appear at a distance of half a mile. He urged that for men seeking to join the service the requirements should be more rigid than would be practicable for those who had been for years engaged in the work.

H. Gifford thought an ophthalmoscopic examination and the inspection of the everted lids should be included. F. Allport believed that the examination should always be made by an ophthalmologist and not by a lay servant of the company. E. Jackson urged the necessity for tests that would reveal the presence of central colour scotoma. It was also essential to encourage employés to report their acquired disabilities, by not discharging the men for such cause, but transferring them to other positions in which they would not be dangerous to themselves or others.

Retinal Sequels of Febrile Disease.—W. K. Rogers (Columbus) reported seven cases of retinal disease in soldiers who had recently contracted fevers in the campaign in Cuba and Porto Rico. They had suffered from yellow fever, typhoid fever, malaria and dysentery. The lesions were chiefly retinal swelling and opacity, and hæmorrhage.

Orbital Symptoms and Treatment of Disease of the Adjacent Sinuses.—C. S. Bull (New York) pointed out that tumours of the bones of the skull and their contained sinuses may extend in every direction from one sinus to another, and often exist a long time and reach a large size before appearing in the orbit.

The Frontal Sinus is rarely the seat of primary tumours except osteoma. Empyema and mucocele, which usually becomes empyema, are its more common diseases. Trans-illumination is a very uncertain aid to diagnosis, for the dimensions of the normal sinus are variable, and one sinus may be entirely absent. Abscess of the frontal sinus should be opened early, drained and washed out with bactericidal solutions. In rare, recent cases, the opening may be through the nose ; but all others should be opened externally. The opening may be made with a gouge and mallet, or with a half-inch trephine, and enlarged with a gouge to admit free exploration of the entire sinus. In most cases it will be necessary to open freely into the ethmoid cells, and in every case a free opening must be made into the nasal fossa. After thorough cleansing a drainage tube should be inserted and the external wound closed. The diagnosis of osteoma growing into the orbit from the frontal sinus rests on the location, extreme hardness, and immobility, and its direct connection with the bone and slow painless growth. The treatment is removal, unless the tumour be of great size and have probably involved the anterio cerebral fossa.

Empyema of the *Maxillary Antrum* is attended with pain in the cheek unless there is free drainage, and the escape of pus from the antrum is positive evidence of the disease. The orbital symptoms are displacement of the globe and orbital cellulitis, and the diagnosis may be aided by trans-illumination. The best treatment is to open the antrum freely at the level of the canine fossa, curette and irrigate with a strong solution of zinc chloride, and later to make a large opening into the nose immediately above the floor of the antrum, place a drainage tube from the antrum into the nose, close the external opening and irrigate the antrum several times daily.

Disease of the Ethmoid is extremely obscure, and trans-illumination is not to be relied upon for its recognition.

Pus found in the middle of the region of the turbinated bone must come from the posterior ethmoid cells. In mucocele there is gradual, painless development of a tumour in the inner wall of the orbit, with, later, fluctuation and displacement of the eye-ball. In caries there is dull pain, increased by pressure; and redness of the lids at the inner canthus may be present. In all cases pus should be evacuated and carious bone removed. A free opening should be made from the ethmoid into the nose, and daily irrigation kept up until all discharge ceases. Osteoma of the ethmoid appears as a very hard tumour, just behind the inner canthus. It never penetrates the cranial cavity.

The Sphenoid is so intimately connected with the ethmoid, that chronic processes are apt to involve both. Headache from empyema of the sphenoid may be located in the back of the head. The thinness of the lateral walls may permit involvement of the optic nerve. Since the ethmoidal cells are usually involved, it is usually best to open them and through them to clear out the antrum of the sphenoid.

For Malignant Orbital Tumours arising in the deep facial bones or their sinuses, the prognosis is bad. Surgical interference is almost invariably followed by a return of the tumour; and with each succeeding operation the period of relief grows shorter, and the rapidity of the growth increases. Repeated operations in these cases shorten life; although it is a duty to operate to relieve severe or unbearable pain.

Relation of Diseases of the Sinuses to those of the Eye.—J. H. Bryan (Washington) referred to the ocular reflex disturbances that arose in connection with disease of the adjoining sinuses, and the difficulties of recognising sinus disease. The most frequent reflex is a supra-orbital neuralgia. Abscess of the orbit results, in the majority of instances, from extension of inflammation from one of the sinuses, most frequently the frontal. Disease of the ethmoid rarely affects the eye so long as there is a free discharge into the nose. The frequency of sphenoidal disease is unknown, because its diagnosis is extremely difficult.

Eye Troubles from Naso-Pharyngeal and Aural Disease.—J. A. White (Richmond, Va.) said that disease of the naso-pharynx could extend to the eye and its appendages in various ways, as by direct infection along the tear passages, by mechanical obstruction of the lower end of the nasal duct, by the blood or lymph channels, by toxine poisoning, or by reflex influences. With regard to the connection of ocular with aural troubles there is uncertainty.

The Visual Field in Chronic Glaucoma. — G. E. de Schweinitz (Philadelphia) reported a study of 184 charts of the visual field, made in 63 cases of chronic glaucoma. He grouped these fields under the following heads:—(1) The commonly described contraction of the field, often regarded as typical of glaucoma; (2) The horizontal hemianopic visual field; (3) Various atypical contractions of the field, the general nature of which is indicated by the names describing the shape of the field, as acorn-field, dumb-bell field, and kite-shaped field.

Although it is commonly stated that the nasal field is affected earliest and most severely, he found this by no means the rule. The average of all his observations yielded a field with the following dimensions:—outward 56°, upward 26°, inward 25°, and downward 37°; a field concentrically contracted, and not especially restricted on the nasal side. He found, also, that the correspondence of the colour fields to that for form could not be regarded as a differential test between glaucoma and simple optic atrophy, inasmuch as the colour field in glaucoma was often correspondingly more contracted than the form field. He found that a scotoma could usually be demonstrated in some part of the field; and believed that a study of these scotomata would be more valuable as a method of differentiating this disease from optic atrophy than the study of the colour fields, and they might throw some light on the prognosis for operative interference.

Cyst of Iris following Discission for Cataract.—S. C. Ayres (Cincinnati) reported the case of a boy, who at six years presented lamellar cataract with nystagmus and convergent squint. Iridectomy was done on each eye and tenotomy on the left internus. The patient was not seen for fifteen years, when he had a milky cataract in each eye, and discission was successfully performed. Two years later a secondary membrane had formed in the left eye, and a cyst sprang from the lower inner angle of the iris, measuring 5 mm. across, and obstructing the lower half of the pupil. The cyst was removed with a portion of the iris, and vision was good for some time, but a slow progressive degeneration was now going on.

Operations for Secondary Cataract.—J. M. Ray (Louisville) reported some personal experiences with operations for capsular membranes following cataract extraction. After 141 extractions, 53 cases required secondary operations. Of these 5 required two such operations, and 2 required three, making a total of 62 operations. The knife-needle was used in 43 operations; there were 9 double-needle operations, the hook was used in 4, the Graefe knife in 3, and de Wecker's scissors in 1. Two eyes were lost in the series of 141 extractions, and 2 were completely lost in the series of 53 cases of secondary operation; while in several others serious and annoying sequels resulted. In one of the eyes lost by panophthalmitis the trouble was clearly seen to start in the vitreous, at the seat of the needle puncture. In another case, a grayish-yellow line, resembling pus, stretched to the corneal puncture; this case recovered. In a third case, detachment of the retina followed the operation; in a fourth there was glaucoma; and in the fifth a low form of iritis, with ciliary injection and tenderness, began in one eye and then invaded the other. The sooner the membrane was divided, after the eye was free from irritation following the extraction, the easier the manipulation and the less danger of complication.

Intra-Ocular Hæmorrhage after Cataract Extraction.—A. R. Baker (Cleveland) reported a case in which both eyes were lost through this complication. The eye first operated on (by simple extraction) did well until the sixth day, when the hæmorrhage occurred, followed by iritis, and the eye had to be enucleated for pain. One year later the second eye was operated on, a preliminary iridectomy having been done five weeks before. Within an hour the patient screamed with pain, and the whole contents of the globe were found extruded. He suggested that where one eye had been lost by intra-ocular hæmorrhage, the other should be operated on by the old method of reclination.

Certain Forms of Ametropia.—S. D. Risley (Philadelphia) reported four cases, each illustrating a group of patients and discussed the significance of the features they presented. The first presented relative esophoria, asthenopia with fundus changes, apparent increase of astigmatism, and complete disappearance of the esophoria and asthenopia with the full correction of the astigmatism and co-existing hyperopia. The probable explanation was that the patient was only able to overcome his hyperopic astigmatism (to which had been added the wearing of concave glasses) by strain of accommodation with excessive convergence; that the tension of the lateral muscles had shortened the radius of the horizontal corneal curvature; and that this tension had been gradually relaxed under the influence of a mydriatic and convex lenses, causing the actual change in the corneal curvature which the ophthalmometer revealed.

The second case was one of astigmatism increased almost 1 D. in five years. The third case was one of high anisometropia with violent asthenopia. The better eye had been previously corrected, getting V. $= \frac{6}{5}$. But the correction of the worse eye, although it only gave V. $= \frac{6}{25}$, with the continued wearing of the correction of the better eye gave complete relief from the asthenopia. The fourth case was one of high astigmatism passing from mixed to compound myopic with choroiditis and distressing asthenopia; in which the use of bifocal lenses correcting the ametropia for distance, and giving an artificial far-point of 40 cm. for near work gave relief, and were believed to have checked the tendency to progressive myopia.

Astigmatism after Cataract Extraction. — C. F. Clark (Columbus) had studied the astigmatism following cataract extraction in his own practice. He had sought to trace the influence upon it of the form of operation employed; but had not been able to get any very positive evidence in regard to it, although the astigmatism had seemed rather greater after simple extraction than after iridectomy.

Management of High Anisometropia. — Edward Jackson (Denver) classed cases of high astigmatism with widely divergent meridians as cases of anisometropia; and including these had encountered high anisometropia (2 D. or over) in 46 instances out of 1,000 cases of ametropia. Each case must be the subject of special study. The full correction of the anisometropia should in general be aimed at; but the selection of a lens for the worse eye must at first be tentative. In a few cases of nearly equal vision in the two eyes, one should be corrected for distant vision and the other adapted for near work. In some cases we must be content with correction of the better eye, and the adjustment to the other of the lens enabling it to give most aid in binocular vision. In very high myopia of one eye, removal of the crystalline lens was proper; and if corneal incision to modify astigmatism were ever practised it should be applied first to cases of high anisometropia.

Very High Astigmatism.—T. B. Schneidemann (Philadelphia) reported a case of myopic astigmatism, in which cylindrical lenses of 20 D. were required for its full correction; and these had been worn for several years with great benefit.

Surgical Treatment of High Myopia.—H. V. Würdemann and W. R. Murray (Milwaukee) reported two cases operated on with satisfactory results.

Recognition of Eye-strain Reflexes.—G. M. Gould and Helen Murphy (Philadelphia) had reviewed the literature of different nations, and found but few and slight references in the text-books to the effect of ocular conditions upon the general system. They made a strong plea for the recognition of reflex disturbances due to eye-strain.

Papillitis accompanying Brain Tumour. — J. E. Weeks (New York) discussed the literature of the subject, presenting tables showing the relative frequency of papillitis with tumours of the various portions of the brain.

Value of Cycloplegia.—C. M. Culver (Albany) reported a study of 1,000 cases seen in private practice, in regard to the refraction before and after the use of a cycloplegic. The refraction showed with cycloplegia increased hyperopia or diminished myopia in 80 per cent., the average being 0·62 D. In 16 per cent. the refraction remained unchanged; and in 4 per cent. there appeared to be lower hyperopia or increased myopia under the influence of the cycloplegic. The average increase of hyperopia in persons of from 40 to 55 years of age was 0·50 D. He found homatropin hydrobromate in 2·5 per cent. solution a trustworthy cycloplegic as effective as atropin.

Bacteriology of Acute Conjunctivitis.—C. A. Veasey (Philadelphia) found from the examination of the discharges of acute catarrhal conjunctivitis, that the pneumococcus of Fränkel was the organism most frequently present. Occasionally the Koch-Weeks bacillus was found. The clinical manifestations of the disease accompanying these two organisms were so similar that it was impossible to tell them apart without a bacteriological examination.

Mucocele of the New-born.— C. W. Hawley (Chicago) reported six cases of this condition, in most of which he had been able to bring about a complete cure without splitting up the canaliculi or passing probes through the nasal duct. He used pressure to empty the sac at short intervals, with treatment for the local inflammatory conditions.

Phorometer or Maddox-Rod.—A. A. Hubbell (Buffalo) reported a comparative study of the methods of testing the muscle balance by the Stevens' phorometer and the Maddox rod in 141 cases. In 38 the same results were obtained by both methods. In 71 cases the phorometer revealed less heterophoria than the rod test. In 8 cases the phorometer revealed more. In 10 cases they showed opposite kinds of heterophoria, and in 7 cases heterophoria was shown by the phorometer, but not by the Maddox rod.

Hubbell concludes that the rod test is a more precise and trustworthy guide in daily practice than the phorometer.

The officers chosen for the ensuing year were:—Chairman, H. V. Würdemann, of Milwaukee; Secretary, C. F. Clark, of Columbus. The next meeting will be held at Atlantic City, June 5, 1900.

THERAPEUTIC NOTES.

EUPHTHALMINE.[1]—Darier writes in praise of this new mydriatic as being eminently useful for ophthalmoscopic purposes on account of its rapid action on the pupil, the short duration of such effect, and the fact that there is very little interference with the ciliary muscle. One or two drops of a 5 per cent. solution are sufficient to induce a large dilatation of the pupil which is at its maximum in about thirty-five minutes, and which does not seriously interfere with vision, since the patient's accommodative power is left almost intact; he is able to read a book or a newspaper well enough, though there is a little fogging and dazzling from the expansion of the pupil; in something like two or three hours all the effect of the drug had passed off. If one employs a stronger solution, however—of 8 to 10 per cent.—there was a slight enfeeblement of accommodation, according to Vossius and Winselmann. The latter of these observers sums up the advantages of euphthalmine thus: It produces a rapid dilatation of the pupil; but it does not paralyse the ciliary muscle; it does not increase the intra-ocular tension; it produces no toxic effect; no irritation of cornea or conjunctiva has been observed to follow its employment; and the mydriasis is of very short duration. H. Knapp also has used euphthalmine and approves highly of it.—*La Clinique Ophtalmologique*, April 10, 1899, and *Archives of Ophthalmology*, May, 1899.

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[1] See also OPHTHALMIC REVIEW, 1899, p. 301.

Protargol, Argonin and Argentamin.—The objection to nitrate of silver as an application in acute ophthalmia of gonorrhœal origin, viz., that if used in solution sufficiently powerful to destroy the gonococcus it causes far too much irritation, has led to the employment of many substitutes, few of which possess equal virtue. In protargol and argonin we have two remedies, one of which at least is already very well known now, which are also silver compounds. For these two, Peck, of New York, claims the following advantages: Quicker destruction of the gonococcus; earlier disappearance of the secretion and of the inflammatory process, and resolution of the injured tissue. Protargol is a yellowish powder readily soluble either in cold or hot water, forming a clear solution; it keeps well either in substance or in solution. Argonin is a fine white powder, soluble in water on gently warming, but its solution is slightly turbid; it decomposes if too much heat is used, and when thus decomposed is stated to be very irritating; in solution it does not keep very long. A 2 per cent. solution of argonin is capable of destroying the gonococci in a short time, notwithstanding the fact that it does not coagulate albumen, and even when used in stronger solution seems to have little tendency to set up inflammatory reaction; it has no caustic properties. Protargol is more powerful; ½ to 2 per cent. is strong enough for use, and it is more promptly germicidal; in regard to germicidal capacity Peck places it above either argonin or nitrate of silver. In some of the cases observed by him the gonococcus disappeared in as little as two weeks, and in all before the lapse of four weeks; he thinks, too, that taking his cases thus treated as a whole, there has been less ulceration of the cornea, and more rapid and sound healing than had been his experience under the nitrate treatment; he had found great benefit from its use also in suppurations of the lacrymal sac, and in pus-forming styes. Though the treatment was evidently very painful, he has used protargol even in powder in a few cases of gonorrhœal ophthalmia in the adult.

Galezowski's opinion of protargol is by no means so favourable; he finds it to be distinctly inferior to silver nitrate in the treatment of ophthalmia neonatorum. He has seen the disease advance in spite of protargol, attacking more and more of the cornea, and only becoming arrested when that medicament was entirely put aside and nitrate of silver substituted. He considers that a surgeon would be very ill-advised to think of discarding silver nitrate for protargol. He quotes Ginestous, of Algiers, as having arrived at a conclusion very similar. For his own part, the reviewer would only say that in his limited experience of the use of protargol, he has been more than pleased with its action in ophthalmia neonatorum.

Feuer, of Buda-Pesth, has employed argentamin to some extent in trachoma; he finds that the organic salt of silver is much less powerful than the nitrate, and that the reaction passes off more quickly, so that a 5 per cent. or even 10 per cent. solution may be employed, this corresponding in action to a 2 per cent. solution of nitrate of silver, and that it may be applied daily, and does not require to be washed off; it is less painful also. In presence of these facts it is, he remarks, difficult to understand how some maintain that the organic salt acts more vigorously upon the tissues. Argentamin is a very good application instead of silver nitrate in a simple catarrhal conjunctivitis in a nervous individual, but where there is very profuse secretion, or where there is a great degree of œdema and swelling of the conjunctiva, the inorganic salt is decidedly the better. As regards protargol, his experience in cases of gonorrhœal conjunctivitis has not been at all encouraging; nor does he think highly of it in the treatment of trachoma.—*Medical News*, New York, Jan. 21, 1899; *Recueil d'Ophtalmologie*, April, 1899; *Centralblatt für Augenheilkunde*, May, 1899.

Largin.—The exponents of the newer chemistry are busily engaged in endeavouring to produce a silver preparation which, while destructive to all forms of bacteria, shall cause the minimum of damage to tissues, which shall cause no scabbing, and shall not be precipitated from their solutions by either chlorides or albumen. Largin contains more silver than protargol, in the proportion of 11·1 per cent. to 8·3 per cent.; it is a whitish-grey powder of low specific gravity, soluble in glycerine, blood serum, alkaline and acid albuminates, insoluble in ether and alcohol. It is soluble also in water up to 10·5 per cent. after agitation; on being heated it gives off a vapour of somewhat unpleasant odour; the watery solution is slightly alkaline in reaction, it is easily decomposed by light and throws down a little sediment. Pezzoli's investigations seem to show that largin kills the gonococcus more certainly, that its injurious influence on the tissues in which it is growing is at least no worse, and that its power of being taken up by dead organic substances is greater than is the case with any of the other albumin compounds with silver. The eye does not resent a 10 per cent. solution greatly, though there is a little irritation; the application is indicated in catarrhal conjunctivitis either acute or chronic, catarrhal ulcer of the cornea, trachoma, and sac diseases; where the discharge from the conjunctiva in any catarrhal case is very abundant, a 1 per cent. solution makes a good application to drop into the eye. Falta has not employed it in any case of gonorrhœal ophthalmia.—Falta, *Centralblatt für Augenheilkunde*, Feb., 1899.

Orthoform.—In the treatment of burns, ulcers, &c., orthoform has been much recommended. Darier finds it useful by reason of its powerful and peristent analgesic action in certain affections of the eye. He has employed the application in cases of recurrent ulceration of the cornea, episcleritis, burns of the conjunctiva, burns of the lids, &c. In a case of recurrent ulcer of the cornea, the patient experienced severe pain on the introduction between the lids of a small piece of 13 per cent. ointment, but this quickly passed off, though it was sharp while it lasted, in spite of the previous instillation of cocaine. This is an unfortunate feature of the action of orthoform, but the smart burning sensation on its first application seems to be followed by a much more prolonged period of anæsthesia than is the case with cocaine.—*La Clinique Ophtalmologique*, April 25, 1899.

ABSORPTION OF COLLYRIA.—MM. Ulry and Frézals have studied the mode by which substances dissolved or suspended in water, oil or ointment, are absorbed and gain access to the anterior chamber, and have concluded that while aqueous solutions are taken up readily by the cornea, very little indeed is absorbed by the conjunctiva; that the cornea behaves like a series of superposed membranes of varying permeability, and that the only way in which oily collyria can be taken up is by preliminary solution of the active principle in the lacrymal fluid.—*Annales d'Oculistique*, March, 1899.

Considering the facts that cocaine (alkaloid) is soluble in oil, and but very sparingly so in water, and that this has to be used in preference to the hydrochlorate since this is insoluble in oil, and that oily collyria act as quickly and as well as watery solutions, we must take leave to doubt this last assertion.—ED.

SUPRA-RENAL EXTRACT.—Professor Lewis's (New York) first experience of the use of supra-renal extract was certainly not very encouraging; indeed, he admits that harm resulted. The case was a severe one of gonorrhœal ophthalmia, in which ere the patient presented himself to the writer the whole cornea had already taken on a ground-glass appearance, and there was an ulcer at one spot in the margin. It was hoped that the blanching effect of supra-renal extract might be beneficial in cutting short the destructive process which was evidently making painfully rapid progress. A fresh extract was employed, first of the strength of gr. viij., then of gr. xiv. to the ℥j., which is weaker than what is usually recommended. At first there seemed to be a slight improvement and the red conjunctiva to become less hyperæmic, but this did not last, and even after the ulcer perforated, which it did in a very brief time, the pain still continued and the quantity of pus did not diminish materially, which is contrary to the usual course of such cases. He quotes Dr. Webster as having had a very similar experience in a case of ophthalmia neonatorum under his care. In three cases of hypopyon keratitis, however, all of them so severe as to require paracentesis, and occuring in patients much depressed in general health, Lewis was better pleased. Before paracentesis a few drops of a 10 per cent. solution of supra-renal capsule were instilled as well as cocaine, when not only was the inflamed conjunctiva much more blanched than is at all usual, but during the performance of the operation the eye could be fixed with forceps without pain, which is never the case when cocaine alone is employed. He used it also in a case of acute dacryocystitis, which was incised with less pain than that operation customarily entails; less satisfactory results were obtained in acute glaucoma. Lewis's conclusion is that supra-renal extract merits further trial, but he does not appear to be by any means enthusiastic on the subject.

Bates, who claims the honour of introducing this substance into notice as a therapeutic agent, has been making further investigations into its value. It is, according to him, in the first place a powerful astringent, reducing the vascularity of the tissue, whether normal or hyperæmic, and this without being influenced in any way by the cause; when instilled into the eye it has no effect whatever upon the pupil. It has no anæsthetic property, and has no after-effect, such as an increase of the previous hyperæmia or pain as the astringent influence passes off; it causes no desquamation of the corneal epithelium; hypodermic injection of the extract is very painful. It has been found that the substance is capable of acting as a heart tonic on being instilled into the eye and absorbed into the general circulation. Bates is very emphatic in his statement that no other substance should be added to the solution in the way of a preservative; he made numerous experiments, and came to the conclusion that if a preservative was not actually harmful, it was at least useless. He thinks the vessel-constricting action of the extract particularly valuable in cases of congestive glaucoma, for after its instillation, cocaine, which previously was prevented from acting, is able to produce anæsthesia.—*New York Medical Record*, April 22, 1899, and *Archives of Ophthalmology*, N.Y., May, 1899.

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The Ophthalmic review

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